

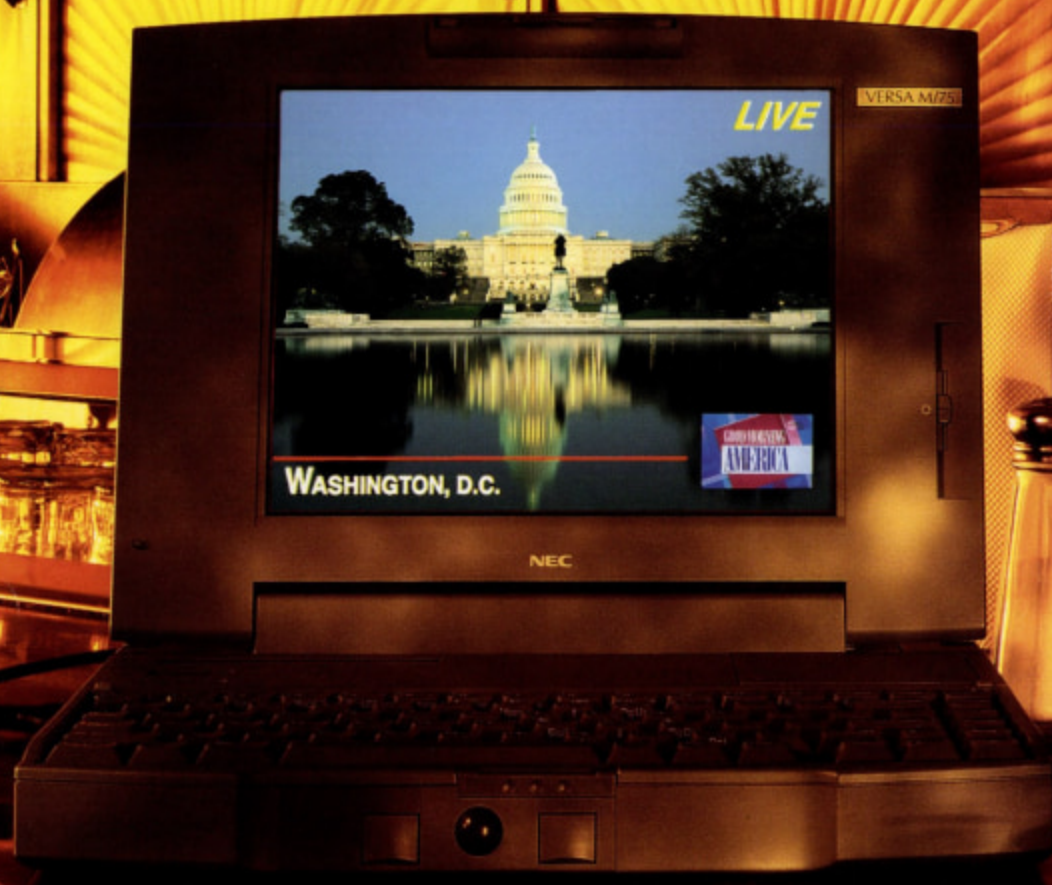
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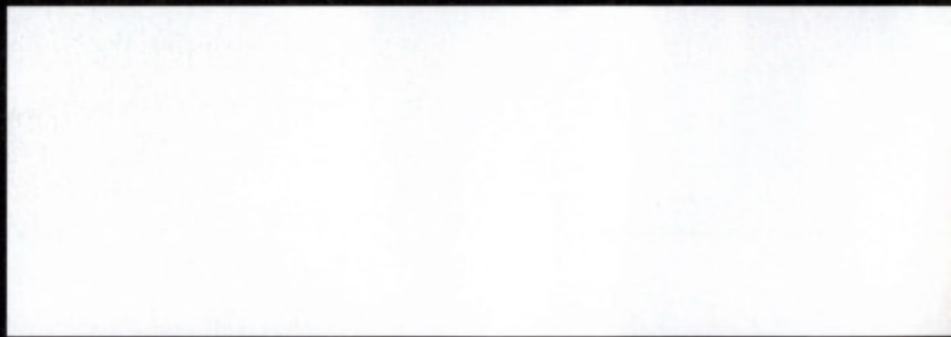
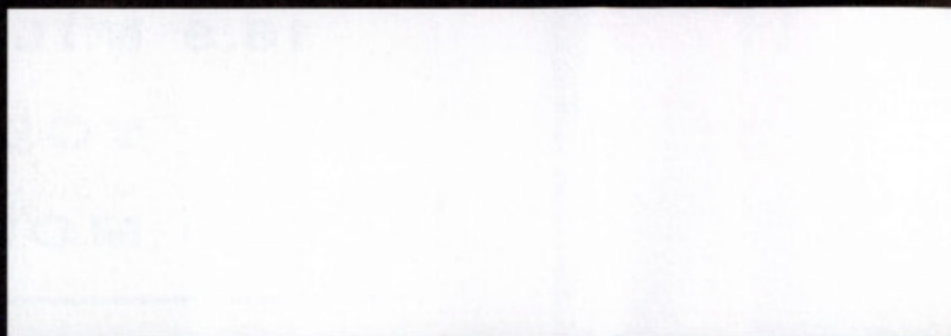
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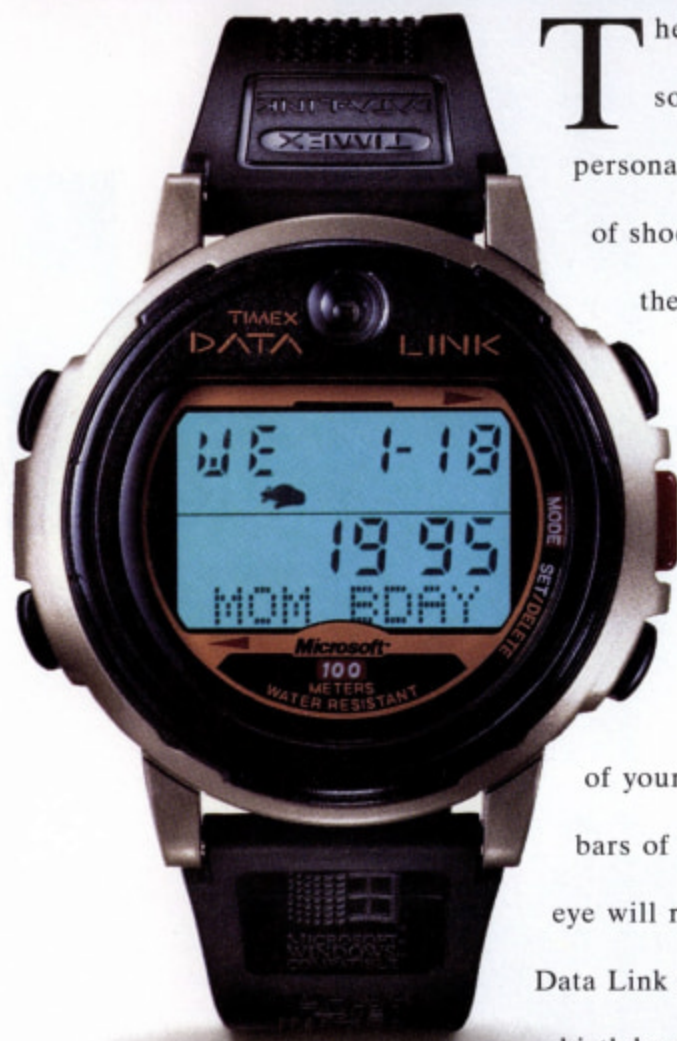


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The Timex Data Link watch: it's like science fiction, but without the fiction.

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little hand with a string around the forefinger appears on the watchface (*Get outta here!*—no, really, it does) as a reminder icon. On the actual day itself, the icon flashes



're kidding me" scores ever recorded.



The Timex Data Link watch can actually read your personal information right from your computer screen.

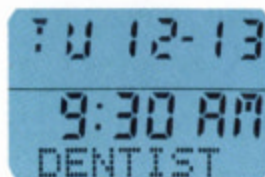
urgently to let you know that your present- or flower-buying time is running out.

When an appointment is approaching, the watch beeps to tell you to get going, and tells you who you're supposed to meet, and where.

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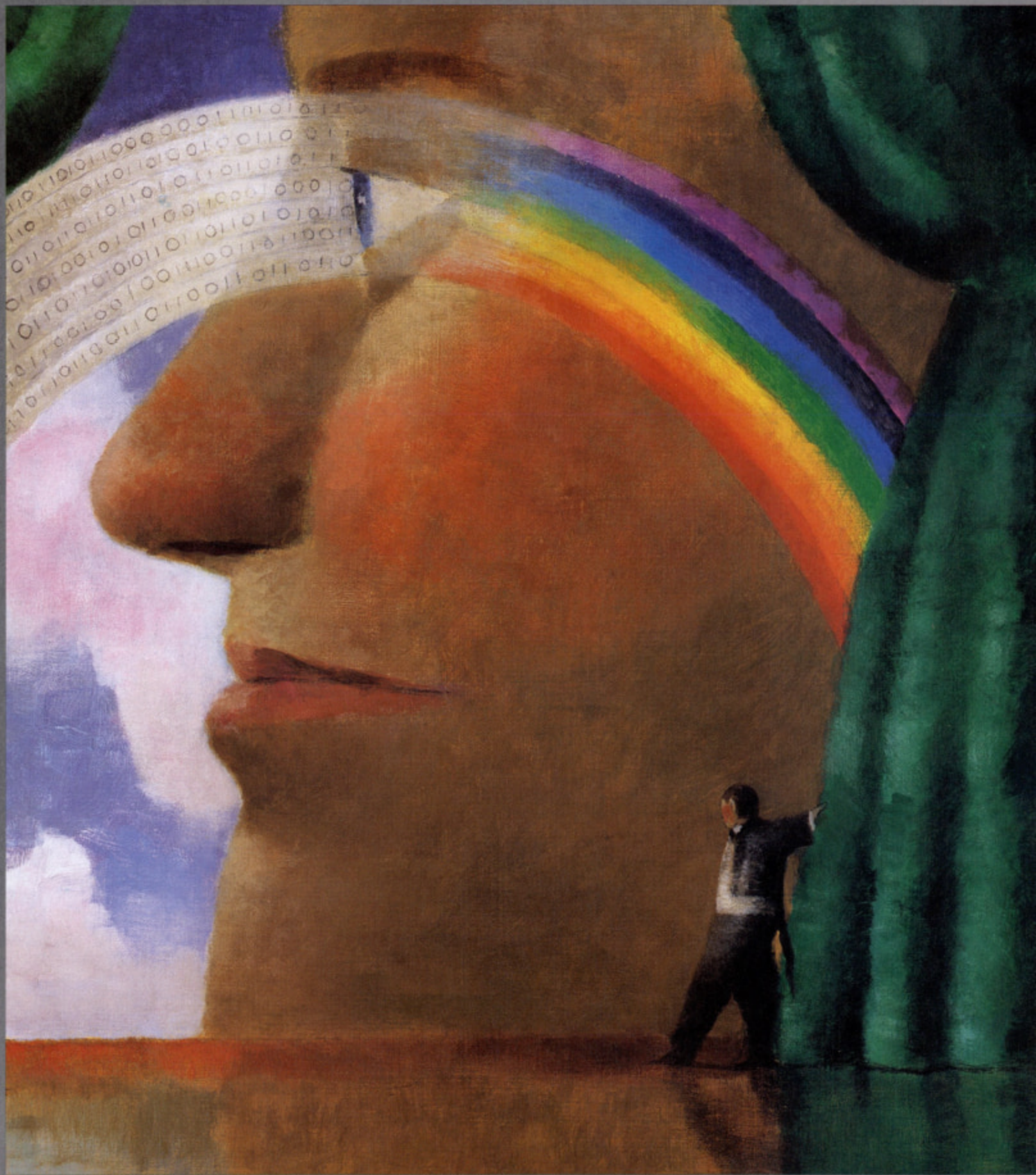
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We've all heard a lot of talk about the *Digital Age*. But what have we seen? Here ends the hype, the hyperbole and all those other "h" words. Introducing the RCA Digital Satellite System. That's not another announcement. That's a fact. Twenty-two thousand miles above the equator are twin satellites using advanced digital technology to give you the kind of picture and sound that will completely rewrite the television history books.



The 60" RCA Home Theatre and DSS System. Digital Home Theatre is here.

You see, your TV is only as good as the broadcast signal it receives. And the current signal hasn't changed since the NTSC first set the standard way back in 1940. In other words, it's well over 50 years behind the times.

Announcing the end of announcements announcing the coming digital revolution.

Enter the DSS system. An entirely new kind of broadcast that can deliver up to 35% more lines of resolution and CD-quality sound.* Combine that with an RCA Home Theatre™ and you get *Digital Home Theatre*. Television will never be the same again. The DSS system will be on the cutting edge well into the next century.

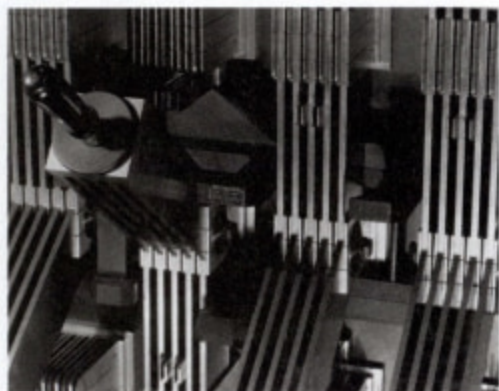
It incorporates MPEG-2, the new standard for digital television. It gives you a laser-disc quality* picture and eliminates many of the problems with today's TV and cable systems. Like interference and video noise. You won't get caught with your technological pants down either. The DSS system has a wide-band data port.

So when HDTV comes along, you'll be ready.† In fact, we're playing a major role in the development of HDTV. This is not fiction. It's reality. The DSS system could be in your living room tomorrow. So, what are you waiting for? **Changing Entertainment. Again.™**



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Ralph Steiner
Power Switches, circa 1930



Hans Bellmer
The Doll, 1934-35



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W E D I E .

*James Porto ►
Centuries End, 1994*

- Régis Debray, page 116



context

-
- 24 **Rants & Raves** Reader feedback
 - 33 **Electric Word** Bulletins from the front line of the Digital Revolution
 - 45 **Fetish** Techno-lust
 - 52 **Reality Check** The Future of Food
 - 54 **Raw Data** Stats 'R' Us
 - 56 **Geek Page** Postcards from the edge

ELECTROSPHERE

- 58 **The Letter U and the Numeral 2** By Colin Berry
- 64 **This Test Is for You** By Carol Cooper with Perry N. Halkitis
- 70 **The Latest Action Heroes** By Scott Rosenberg
- 78 **Sex, Lies, and Cyberspace** By Dorion Sagan
- 86 **Child's Play** By Connie Guglielmo

IDÉES FORTES

- 95 **A Note from the Future** By Cathy Camper
 - 96 **Universal Service Does Matter** By Rob Glaser
 - 98 **No News Is Good News** By Phil Patton
-

- 133 **Street Cred**
- 147 **Net Surf**
- 150 **Netiquette**
- 152 **Deductible Junkets**
- 176 **Nicholas Negroponte**

100



Triumph of the Plastic People

When the return-of-the-repressed came, and the Communist regime fell apart, these mad Czech hippies acquired a cultural authority and credibility like no mad hippies have had ever before, anywhere, any time. By Bruce Sterling

108



Agents of Change

General Magic's Marc Porat believes an economics is emerging, centered around "I want." By David Kline

110



The Wired Scared Shitlist

We have seen the future, and it's not just amazing, it's terrifying. (Happy Fuckin' New Year.)

116



Revolution in the Revolution

In the '60s, Régis Debray fought beside Che Guevara in Bolivia. Today, his obsession isn't ideology – it's "mediology." By Andrew Joscelyne

118



Truckin'

It isn't about weed, whites, and wine anymore. Not when you have information systems masquerading as freight lines. By Todd Lappin

124



Caught

You used to watch television. Now it watches you. By Phil Patton

128



Search and Destroy

Inside the metal-jacketed minds of flight-sim heads. By John Shirley

164



Exile on Pain Street

Robert Frank is still showing us how to see. By Amy Howorth

Intro: Ralph Steiner, The Metropolitan Museum of Art, Ford Motor Company Collection, Gift of the Ford Motor Company and John C. Waddell, 1987; Hans Bellmer, The Metropolitan Museum of Art, Ford Motor Company Collection, Gift of the Ford Motor Company and John C. Waddell, 1987; Berenice Abbott/Commerce Graphics Ltd., Inc.; James Porto, Model: Kimber Bogard. TOC: Ralph Steiner, The Metropolitan Museum of Art, Ford Motor Company Collection, Gift of the Ford Motor Company and John C. Waddell, 1987

Dean Koontz is one of those far-out kind of guys. Yes indeed, where TV signals can't even go and cars dare to tread, that's where you'll find Dean.

In his travels, satellite dish salesman Dean Koontz has sold Who knows who he'll sell to next?

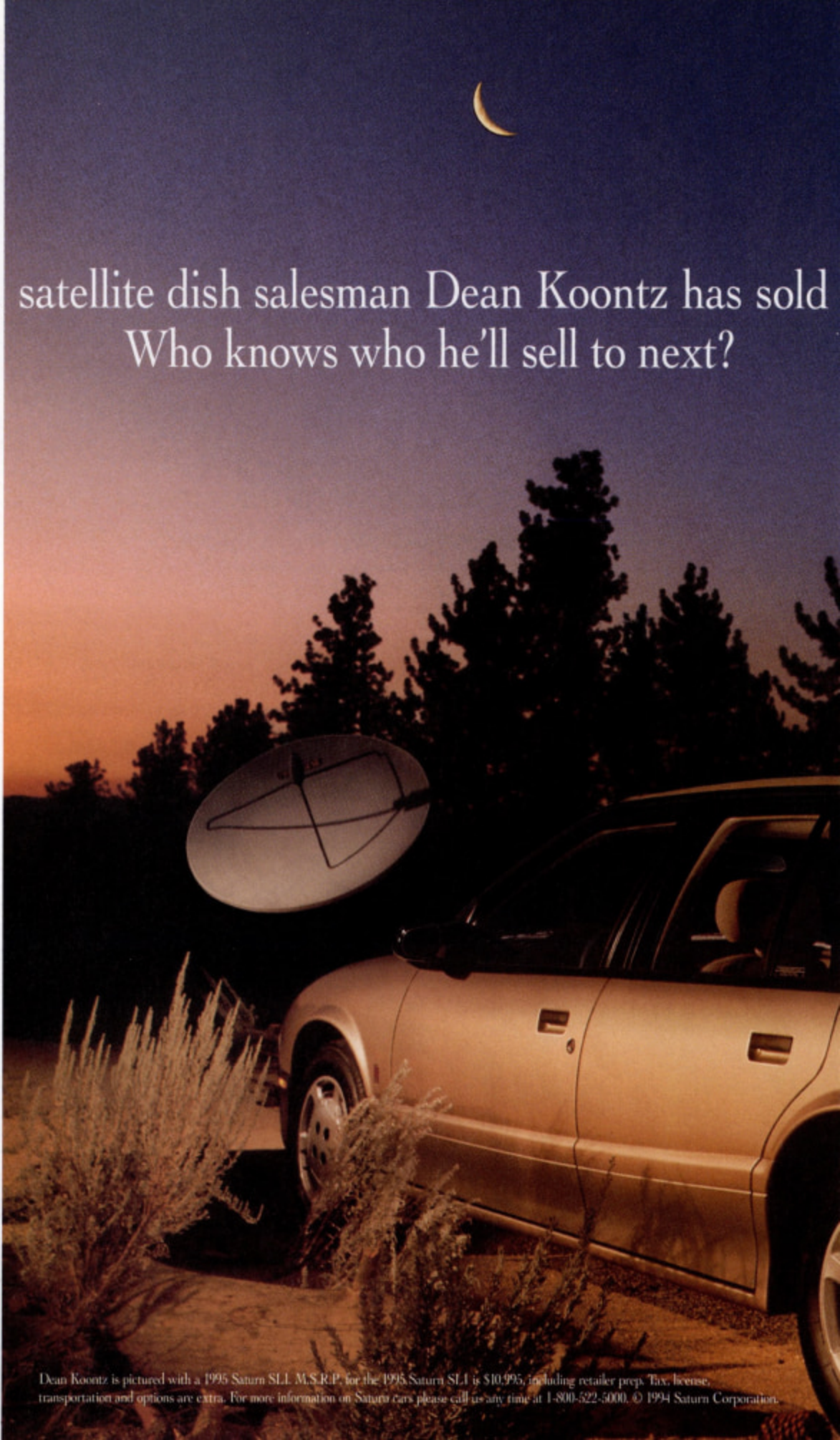
He sells satellite dishes, door-to-door, to the folks in the northeastern parts of Washington state. Which takes him to such out-of-reach places as Kettle Falls, Lost Creek and Daisy. Along such rough and rocky byways as Deadman Creek Road, the Tiger Highway and even Pothole Lane.

Now, with him on his gnarly road travels, you'll find what he calls his "go almost anywhere vehicle." A Saturn SLI, as a matter of fact. Dean says it gets him everywhere he has to go. And he has quite a ways to go.

See, Dean and his Saturn average about 250 miles a day, 75,000 miles a year. And when we last caught up with them, they'd done about 165,000 miles.

By the time he gets to where he's going, his customers are amazed at how he got there. So as he takes out his collapsible satellite dish, he shows off his Saturn. Not surprisingly, in the last couple years, Dean's sold 2,034 satellite dishes...and six Saturns.

Of course, Dean says he's going for 300,000 miles. And who knows where he'll be selling Saturns by then.



Dean Koontz is pictured with a 1995 Saturn SLI. M.S.R.P. for the 1995 Saturn SLI is \$10,995, including retailer prep. Tax, license, transportation and options are extra. For more information on Saturn cars please call us any time at 1-800-522-5000. © 1994 Saturn Corporation.

*Many moons ago, Dean
bought his Saturn
from Jerry Hemmer
at Saturn of Spokane.*

six Saturns.

*Just how far will a Saturn
go? Well, that's hard to say.
The marathon tales are just
starting to come in. What we
can say, though, is Saturns*



*are pretty much at home with
the survival routine. We've
put them through simulated
endurance tests of 100,000 miles,
even 300,000 miles—with a
heap of potholes and torsional
bends. And then we put in
things like a steel timing
chain, dent-resistant body
panels and a stainless steel
exhaust. You know, kind of
like paving the way for a
long and happy life.*



*A Different Kind of Company.
A Different Kind of Car.*

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YOUR AS*S...)) THIS IZ X. ROCKET.))SCI-ENCE...GAME.1...LOAD-STAR. DO(())U READ.)E... THIS I() ROCK

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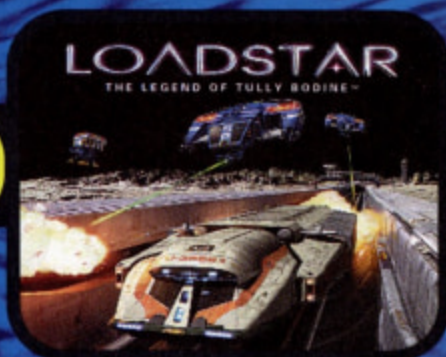
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depend on speedups,
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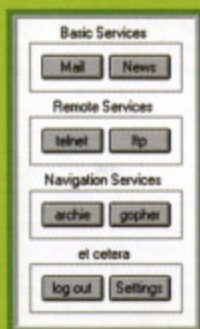
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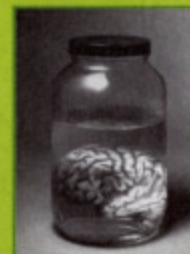


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Technopeasant



If I drink two Sam Adams® my ads usually turn out funnier but it's 10 am right now so that's kinda early. Anyway I used to design athletic shoes for somebody else but I got tired of just building hype and gizmos so I quit, sold my car and started Simple®. Now I build normal lookin' shoes that don't look like industrial design projects. I did hold on to all that athletic foam and all the rubber formulas though so my shoes act damn athletic even if they don't look it. It's a nice combo. *Eric Meyer*

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Oh yeh... Jim K. at Sam Adams® sported me some free beer so I'm spill'n them again so as to return the favor. This ad is being built at home on my Mac® without the aid of any cool new fonts and does not give my online address. (sorry Russ) It was designed with Quark® and Photoshop® and my cat Minnie® doing figure eights around my feet... successfully convincing me® to give up part of my banana® bread.

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Rants & Raves

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Talking (Severed) Heads

Immortality? ("Meet the Extropians," *Wired* 2.10, page 102.) Even if we should conquer aging and most of the more deadly diseases and live to be 150 years old, it has been evinced elsewhere that statistics dictate that some sort of catastrophe, like, say, a safe falling on your head, will take you out of the Methuselah sweepstakes.

Cloning? No matter how good, a copy is still a copy. Assuming you could have a perfect double ready to take your place as soon as you kissed the dirt, I can't see anyone but the most egomaniacal wanting to perpetuate themselves in this manner.

Extropians are just trying to make sure no one else gets their money when they die.

Scott Faulkner

scottfau@microsoft.com

Having just finished Ed Regis's article on the Extropians, I feel compelled to toss in my two cents. The implication that "biology is under human control" is undercut by the reality that AIDS, cancer, and a variety of other illnesses still claim the lives of millions yearly. Likewise, now that human psychology has been chemically sussed out, I suppose we can turn all those obsolete mental institutions into condos.

Don't get me wrong – I think that their positive stance is, in many ways, refreshing in these pessimistic and cynical times. However, the implication that they can defy mortality and become "more than human" reeks of hubris. With a total membership of 300, they should keep in mind that their entire organization is just one hurricane away from complete annihilation. Or do they now have some way of controlling the weather?

Christopher Libertino

New York

These kids represent the intellectually and economically privileged of today's middle class, much like their parents did in their own generation as leaders of the '60s counterculture. (We can ignore the élite; they have lived in a world of their own creation all along.) The Extropians' optimism teeters on the edge

of "feel good" denial. The larger their movement becomes, the greater the danger that a majority of them will lose contact with the foundations of their philosophy – just as some post-Nietzsche groupies misinterpreted Nietzsche's ideas, believing he advocated a separate *Übermensch* that would rule the mediocre masses, not spur the bulk of humanity in self-improvement.

That said, I hope the Extropians can channel their energy into finding real solutions to contemporary problems – and avoid losing their optimism entirely when they encounter real barriers as they grow



older. The worst outcome would be if they were to give up the whole game the first time they hit a formidable obstacle. Perhaps they'll become the millennial version of the '70s idealists, who, in a fit of frustrated, post-OPEC burnout, turned into the yuppies of the '80s. Let's not play *that* record again.

Dan Krimm

New York

I read about the Extropians with a combined sense of fascination and bewilderment (not to mention a giggle or two). Without a doubt, this planet certainly needs more yea-sayers, and the unbridled optimism of the Extropians is sorely lacking in most spheres these days. Even so, I've got a small bone to pick.

Regarding their Nietzschean leanings, the doctrine of overcoming man, of the "Overman," has nothing to do with immortality. The Overman doesn't want to overcome death, but rather, the stigma of death. Overcoming death is not the way to

overcome man, for cheating death is what man has tried to do all along.

Nietzsche did not consider for a moment that one might want to last forever.

James MacKenzie

jam@exoterica.com

Tiny Tiles on the Net

Your article on Mosaic ("The (Second Phase of the) Revolution Has Begun," *Wired* 2.10, page 116) concentrated a great deal on whether Mosaic Communications Corporation was going to try to become the Mosaic Microsoft by staying far enough ahead of everyone in the next couple of years to control the de facto standard. I can't evaluate whether they truly want to do this; regardless, your article never really discussed how difficult this would be.

Certain features can be added to the Mosaic client in isolation for user customization and support for additional protocols, but the key issues (new document/protocol standards, encryptions, financial transactions)

require that standards be followed by the client software and the server software. Thus, there are two groups of independently minded cusses that MCC would have to bulldoze if it were to set significant monopolistic standards on its own.

In addition, the company would not be acting in a vacuum. CERN and MIT recently created the W3 Organization (<http://info.cern.ch/hypertext/WWW/Organization/Consortium/W3OSignature.html>) – a consortium that will push the standard forward in an interoperable way, making it more effective for use by education, government, research, and industry.

Bill Seitz

seitz@scp.com

In his short piece on using the Internet ("Slip into the Net with Shareware," *Wired* 2.10, page 124), John Ost says that to use Mosaic, you need a "true" Internet (IP-type) connection. This is not quite true. It is possible to use NCSA Mosaic (not to mention ncftp, telnet,

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Here they come

gopher, and IRC) via a standard Unix shell dial-up. All you need is a nifty little program written by Michael O'Reilly (michael@iinet.com.au) called "Term."

The following is taken from Term's README file: "Term is a program to implement a slip-like connection between two Unix machines. It isn't sl/ip. It runs entirely in user mode. It requires no kernel support on either end, and no root access on either end. It is built to run over a modem to connect a non-Internet machine with an Internet machine."

Term is a good alternative for people who cannot afford a SLIP/PPP type link, or simply can't get one.

Nikolas Tumbri
riviera@werple.apana.org.au

Gary Wolf's article on Mosaic included some information we at the University of Illinois would like to clarify. The first has to do with inaccurate information about our proprietary software. References to "Mosaic" should be properly identified as "NCSA Mosaic™."

"NCSA Mosaic™" is an Internet browser product that was developed, and continues to be developed, by employees at the National Center for Supercomputing Applications (NCSA) at the University of Illinois at Urbana-Champaign. The Board of Trustees of the University of Illinois owns the copyright to the software and the trademarks for the product name and the spinning globe logo. Although the university makes licenses for some of our software available to the public at no charge for academic, research, and business uses, it is not in the public domain.

A master license agreement with Spyglass Inc. of Savoy, Illinois, for all future commercial licensing and development was announced on August 24, 1994, by the university. Spyglass has entered into several sublicenses. The University of Illinois has also signed limited commercial license agreements with 10 other companies. All university licensees are listed below in alphabetical order: Amdahl Corporation; Electric Power Research Institute (EPRI); Fujitsu Limited (Japan); Infoseek Corporation; Quadralay Corporation; Quarterdeck Office Systems Inc.; The Santa Cruz Operation Inc.; Spy Inc.; Spyglass Inc.; Sun Microsystems Inc.; and Ubique Ltd. (Israel).

Richard C. Alkire
Vice Chancellor for Research and
Dean of the Graduate College
Champaign, Illinois

In his article, Gary Wolf claims that "Prodigy, AOL, and CompuServe are all suddenly obsolete." Should we buy a burial plot for these online services next to the headstones of advertising and the newspaper? Come on, guys. You're starting to sound like the magazine that cried wolf.

Media don't die, they're merely co-opted.

Tom Wang
mtwang@aol.com

Virtual Ronald

Here is my suggestion on how to use the mcdonalds.com domain (if it is still there) ("Billions Registered," *Wired* 2.10, page 50). How 'bout making it a WWW location for health-food information? Or a location for FDA violations by fast-food restaurants?

Just a university student killing time.

Graham Hudson
gahudson@undergrad.math.uwaterloo.ca

Penn and Ink

The journalistic marriage between Penn Jillette and Joshua Quittner was made in heaven. The best thing I've read in years.

Linda Lampe
Chapel Hill, North Carolina

Did you fry Penn yet? ("Buy this magazine or we fry this magician," *Wired* 2.09, cover.) I didn't buy your magazine. You promised.

Terry Dineen
Dysinformed Inc.
dineen@odi.com

I vote that you connect Penn Jillette's nuts to 30,000 volts and fry the sucker. He is one stupid, unfunny asshole.

A Faithful Reader

Ownership Changes?

Is it me, or were you guys recently bought out by *Entertainment Weekly*?

John Holland
holland@netcom.com

Li'l Science Wars

Beakman's World? ("Gonzo Science Class," *Wired* 2.08, page 110.) *Beakman's World*?! Come on. Get a clue. Network TV still sucks. *Beakman* is but a hollow clone of the true champion of science for the 13-and-under set — *Bill Nye, The Science Guy*.

Nye plays himself — he's not an actor. Nye's show has a frenetic pacing that makes CBS's *Beakman* look tepid. Nye's show has a cool theme song. And, the big plus: Nye's show is backed by the National Science Foundation.

Brian McNett
BrianMc@aol.com

Bill Nye, *The Science Guy* can be seen weekday afternoons on PBS and weekends on local broadcast television. Check your local listings for time and station. — *The Editors*

Fatuous Fetishes

Wired 2.10's Fetish section hypes the Datasonix Pereos ("Info Imp," page 42), a tape drive that can put a copy of a 600 Mbyte disk onto a microcassette in "just six seconds."

Not even the Vulcan mind-meld works that fast.

Some facts for comparison: a typical PC disk transfers at about 1 to 2 Mbytes per second, a decent workstation's SCSI system copies, one way, at 3 to 5 Mbytes per second, and a high-powered, striped RAID system (where data is stored on multiple disks, allowing them to transfer simultaneously) can pump at up to 25 Mbytes per second. None of these can get 600 Mbytes of data to even main memory in six seconds, never mind trying to put it onto a tape whose mechanical design was optimized for the slow bit rate of the human voice. I won't mention how fast you can put 600 Mbytes over a parallel port, but Rip van Winkle would think it a long time. The only way any tape can fulfill this claim is if the disk has no data.

Lance Berc
berc@src.dec.com

We apologize for the confusion. The transfer rate of the Datasonix Pereos is actually 10 Mbyte per minute, not 100 Mbytes per second. But hey, what's a few orders of magnitude among friends?

— *The Editors*

Not So Fast

I read with interest your article on The Apology Line (*Wired* 2.10, page 32). It could be a very lucrative little business if Mr. A were to add Caller ID to his lines and record the information along with the apology. I nearly called the line before this crossed my mind.

George Ray
75360.1635@compuserve.com

You Forgot One

Jacques Leslie's article on electronic scholarly journals ("Goodbye, Gutenberg," *Wired* 2.10, page 68) summarized developments in this field quite well, yet Leslie failed to mention the granddaddy of electronic journals, *Postmodern Culture (PMC)*, published by North Carolina University, Oxford University Press, and the University of Virginia's Institute for Advanced Technology in the Humanities.

Expanding on the e-mail ASCII version of *Postmodern Culture*, the institute has opened a Web site that is one of the leading examples of scholarly electronic publishing in the humanities. You'll find it at <http://jefferson.village.virginia.edu>.

Click along to the *Postmodern Culture* home page, and you'll find all the current and back issues of *PMC* — check out the January '94 article on the indeterminate gender of the classic cartoon character Krazy Kat, complete with annotated panels from the original strip. From the *PMC* home page, you can also access the "virtual conference center," *PMC-MOO*.

Lillian Hastie
Oxford University Press, US
lmh@oup-usa.org

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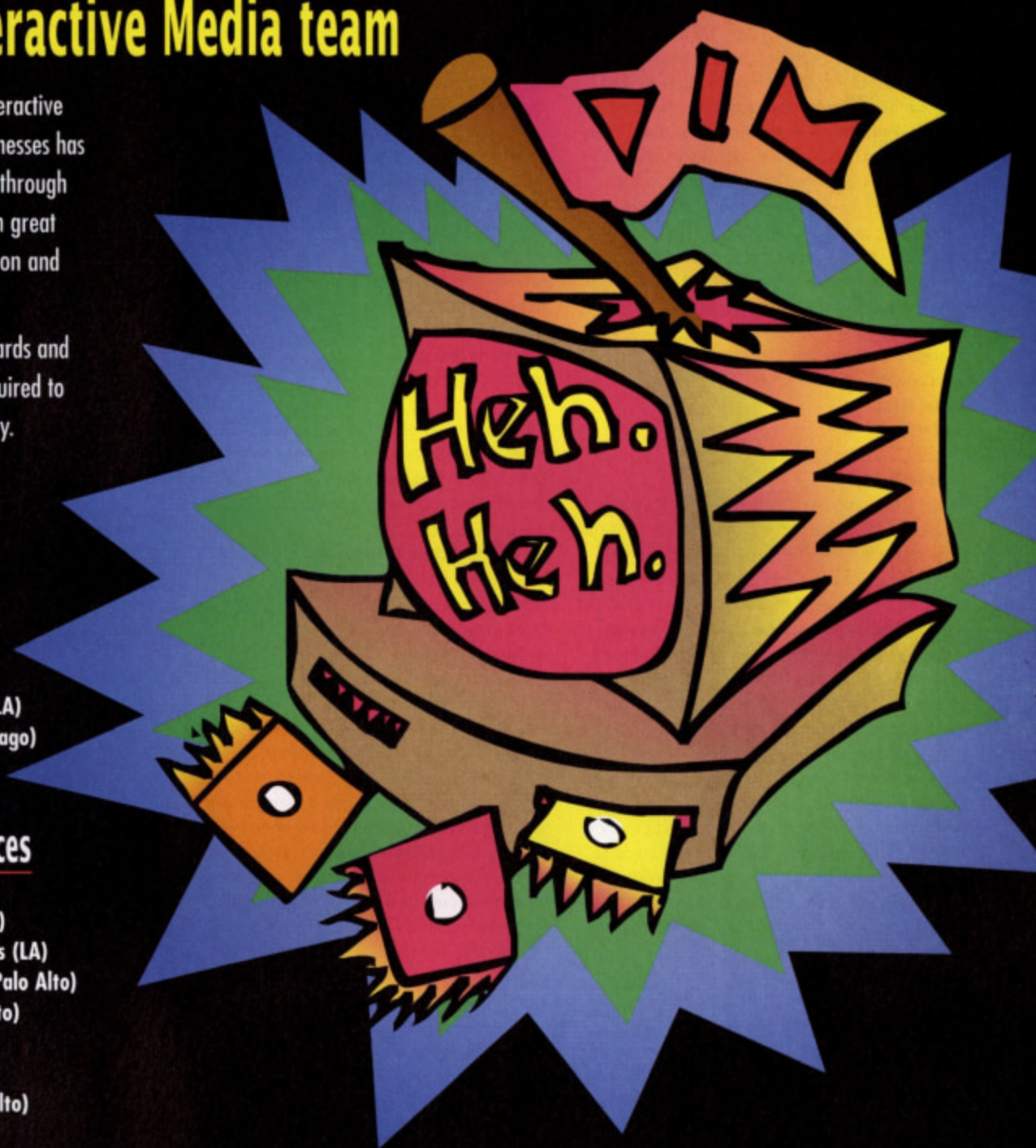
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Spare Us the Spew

Unlike some, I do enjoy a bit of pop-literary "cul-chuh" with my dose of high-tech info-gobbling. However, I really must take exception with the inclusion of Neal Stephenson's "Hack the Spew" (*Wired* 2.10, page 91). C'mon, guys (and it is guys, isn't it?), is this the depth to which cyberfiction has sunk? – "Are you on the trail of the next unexploited market niche – or just on a nookie hunt?" Am I to understand correctly that the climax of the excerpt is watching some young woman in her underwear jumping on a bed with the same abandon a 3-year-old would aspire to? How truly adult and cutting-edge. And no, the gratuitous reference to the artwork of Ray Troll couldn't carry the story. Give me "Microserfs II" or another "Rage" any day. "Hack the Spew"? I think not. More like Spew the Hack.

Darrel Plant

DPlant@aol.com

Hidden Math

Nicholas Negroponte, in "Sensor Deprived" (*Wired* 2.10, page 158), argues that something almost magical happens between two people when their eyes meet across a crowded room; that you can tell if someone is making eye contact with you and not just looking over your shoulder at a point 20 feet away, a difference of a "tiny fraction of a degree." Surely, he argues, the human mind is not figuring this through trigonometry, as that would require unthinkable measurement and computation.

My question is this: has Mr. Negroponte ever played baseball? How do I know exactly where to put my hand to catch a flying baseball, of varying speed, along a certain trajectory, etc.? Is that magic too? Nah. I think he's simply not giving enough credit to the human mind. We are, in many ways, walking calculators, and somewhere in our little primal brains, there is a working calculator that understands math better than we do.

Bill Everding

weverdi@american.edu

Eye contact is the same magic that allows a dog to recognize its master from far away by his or her gait.

There isn't enough resolution to compute eye angle.

A baseball presents a different phenomenon, that of the feedback loop. You do not know where to put your hand, at first. After first doing so approximately, you refine the estimate as the ball continues to come closer.

If I left the impression that humans don't compute well, forgive me. That was not intended at all. We have all spotted people out of the corner of our eyes – in some cases it may have been a person we might not have seen for 10 years or more. Yes, the brain is computing, but, like eye contact, something else is happening beyond math as we know it.

– Nicholas Negroponte

Memetic Correction

I enjoyed Mike Godwin's article "Meme, Counter-meme" (*Wired* 2.10, page 85) and his description of the fertile memetic soil of the Net. I was disappointed, however, to find that Godwin did not credit the idea of the meme to its creator, Richard Dawkins.

In his sociobiological book *The Selfish Gene*, Dawkins produces the idea of the meme as an extra-genetic method of evolution. This book is one that ought to be read by those interested in memetics and the socio-ethical issues arising from it. The reference would have added weight to Godwin's piece – and helped *Wired* veer away from the techno-dilettante style with which it constantly flirts.

Michael Sellers

New World Designs

sellers@teleport.com

Michael, in my original draft of the essay I credited an essay by Keith Henson in Whole Earth Review. That essay, in turn, credited Dawkins. The reference was removed in the editing process. – Mike Godwin

My Opinion of Your Magazine

Two words: information overdose.

John Sweeney

(binarysound)

jds@access.digex.net

The Other Clinton

I read with great interest your article on George Clinton ("Hey Man ... Smell My Sample," *Wired* 2.08, page 74). I am a product manager at E-mu Systems in Scotts Valley, California – the leading company in sampling technology for music. We often find ourselves in the position of wanting to encourage sampling in the course of marketing our products while trying to ensure that our users obtain permission for the samples they use. It is very difficult in many cases, especially for small-time musicians and low-budget productions, to obtain this permission. As a result, many musicians simply use the material and figure if they get caught, it will happen because they're making too much money.

George Clinton's open attitude and logical royalty system will no doubt result in larger revenues for him in the long run (provided his grooves do not fall victim to overexposure). His solution should be used as a model by all artists.

Matt Ward

Matt_Ward@qmmac.emu.com

Reed Reads

I was less than pleased with some of the statements included as fact in the opening of my interview ("Read Hundt," *Wired* 2.10, page 72).

For example, the introduction cites the fact that "Bell Atlantic and Tele-Communications Inc. blamed the rate rollback for the breakup of their multibillion-

dollar marriage." Yet later in the interview, author John Heilemann references a *Wired* interview in which John Malone acknowledges that it wasn't the rate rollback that caused the breakup. The Malone interview has been cited again and again for his joking reference to shots fired at me, but the real ammunition in that piece was Malone's extraordinarily revealing discussion of how cable will compete with the telephone companies, and the real reasons for the dissolution of the potential Bell Atlantic-TCI merger.

The introduction also says that "Hundt made charges of cronyism all the more credible by bragging he was the only man alive to give money both to Gore's first congressional campaign in Tennessee and to Clinton's first run for governor...." While I've heard lots of different charges leveled at me since I arrived, cronyism isn't one of them.

Reed Hundt

Chairman, FCC

Undo

• An important correction to Joshua Quittner's piece in issue 2.10 ("Billions Registered," page 50): the address for Women's Wire is wwire.net. • As for that mention in our Electric Word section of the first public library on the Net (*Wired* 2.10, page 34), naming the first is always a sticky wicket. Regardless, be it known that Seattle went online in 1993, while the Cleveland Public Library went online in 1990. • Embarrassing oversight of the month: "VSLI," three times on page 113 ("Neurobotics," *Wired* 2.10, page 111). Of course, it should have been VLSI (Very Large Scale Integration). • Though the error was not one of ours, it should be noted that bell.com's actual Web address is <http://www.bell.com>. • In our review of *The Ultimate Robot* ("Isaac Asimov's The Ultimate Robot," *Wired* 2.10, page 123), we may have misled people. The developers of this title were from the Judson Rosebush Company. Also, the robot tool kit was designed and programmed by Matthew Schlanger. Ralph McQuarrie was responsible for the robot drawings used as the building blocks in the tool kit. • In "Old Engineers Never Die, They Just Stop Being Upgraded" (*Wired* 2.09, page 34), we printed the e-mail address of the Institute of Electrical and Electronics Engineers incorrectly. Their correct address is: ieeeusa@ieee.org. Other autoresponse files you may find useful include: job listings for members, w.anderson@ieee.org; for Washington internships, info.ieeeusa.wise@ieee.org; and becoming involved in student professional awareness conferences, info.spac@ieee.org.

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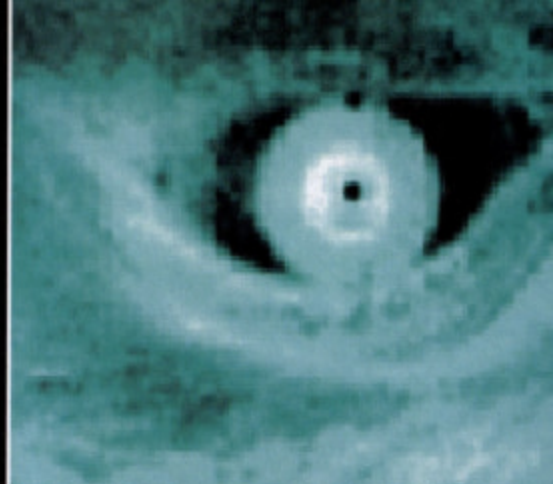
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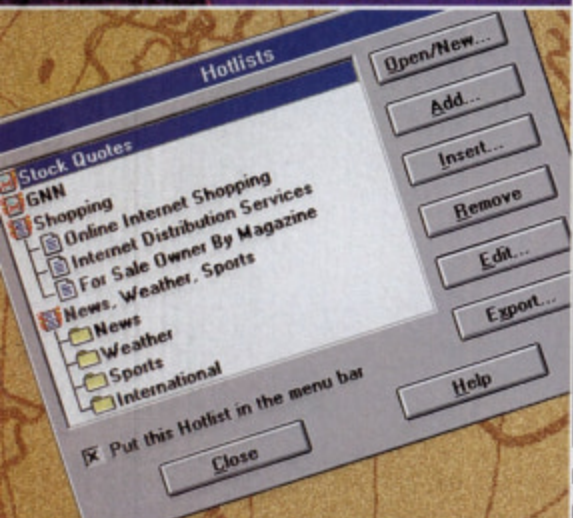
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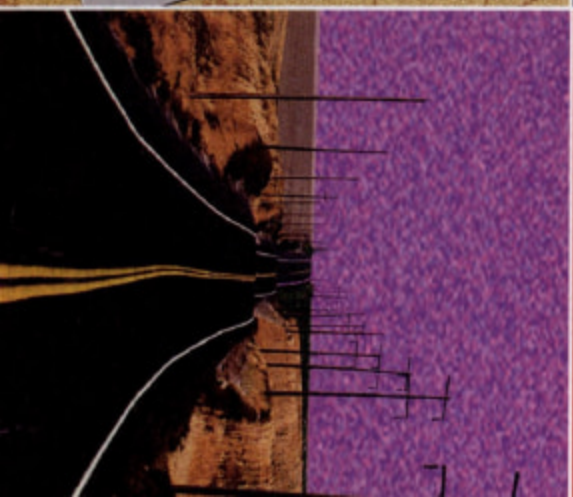
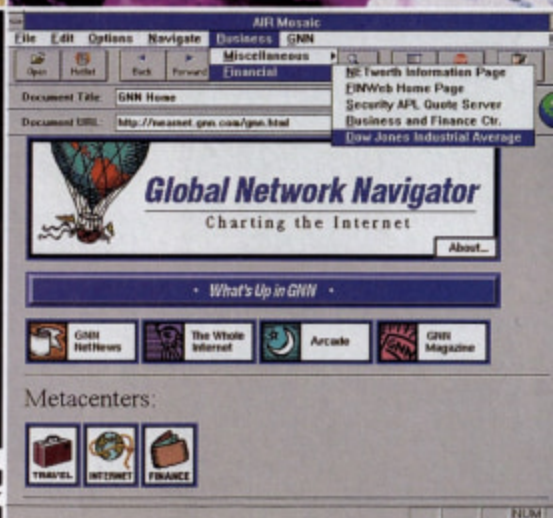


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Which photograph has
been digitally retouched?
Fred Ritchin wants you to
know. (See answer below.)

Can't Retouch This

New York University professor Fred Ritchin, a former *New York Times Magazine* photo editor, has watched how image-processing software chips away at what he sees as the credibility of photographs.

Working with a committee of grad students from NYU's Interactive Telecommunications Program, Ritchin has devised a small symbol of a crossed-out camera lens to identify images that, through doctoring or retouching, are no longer simple mechanical reproductions of a moment in time.

Many photojournalists have greeted the NYU proposal enthusiastically. Several major agencies and organizations have adopted the proposal, including the 5,000-member American Society of Media Photographers. Says society Executive Director Richard Weisgrau, "Our position is that no photograph presented as news should be altered, and that other noncommercial images that have been altered should get the icon. Don't give the public the chance to believe that the image is opinion, not fact."

Publications have been less amenable. "Publications will have to get burned a few more times" before they see that keeping fact and fiction straight is in their interests, too, says Weisgrau.

But is there really such a thing as an objective photograph? Even varying the development time can change the message of a photo. As musician/artist David Byrne points out, "All images that appear in the press are manipulated in one way, shape, or form If you think what you're seeing is the truth, then you're in for big trouble." The Interactive Telecommunications Program at NYU: +1 (212) 998 1891. — *Steve Bodow* (Answer: Neither photo was manipulated.)

≡III Happy Golly Darn New Year: Golly! Peruse this month's Electric Word and you see two cases of Morality's Stormtroopers on Parade. In one case, a guy was told that he couldn't even draw stuff he was thinking. Time for the nutty legislators in Oklahoma and Florida either to get with the program or, better yet, secede. ≡III Eye on the Newt: Speaking of nutty legislators, probable House Speaker-to-be Newt Gingrich (georgia6@hr.house.gov) tossed an impressive-sound- ▶

W O R L D FREEdom on the Net in India

In much of the world, laws have not kept up with technology. But in India's case, communications legislation is all the way back in the 19th century. The Department of Telecommunications has the power to build, license, and monitor communications networks, thanks to the British-written Indian Telegraph Act of 1885. Apart from allowing the department to set arbitrary licensing terms, the act gives it the authority to intercept messages without a court order in the "interest of public safety." When the department recently announced that it was charging absurd license fees — a minimum of US\$50,000 annually for BBSes, and even more for nationwide e-mail providers — Net users across the country protested by forming the Forum for Rights to Electronic Expression (FREE).

The organization conducts its work

publicly over Indian Fidonet BBSes, where about 50 people are actively involved, and more than 500 have read discussions. FREE hopes to publicize and change these laws, which are out of place in a democracy with a constitutional right to free speech and privacy.

While FREE has garnered media attention in India, the department so far has refused to respond to its letters. Business India Information Technology, the major Internet mail provider, has applied for the license but has not yet paid the fee to do so. Sprint-RPG, which started its mail services in October, has paid an undisclosed fee. No BBSes have paid the license fee.

You'll find FREE on the World Wide Web at <http://www.eff.org/pub/Groups/FREE/>, free@arbornet.org, or via fax at +91 (11) 4601978. — *Rishab Aiyer Ghosh* (rishab@arbornet.org)





We want to change the paradigm of the medical examination room from four bare walls and the smell of alcohol to a mini-movie studio," says Dr. Ralph Grams, a professor of pathology and director of medical systems at the University of Florida College of Medicine. His System 2000 medical diagnostic tool fits in a briefcase and contains a multimedia computer and modem. Its development was funded by NASA so astronauts could diagnose themselves in faraway space stations.

Doctor-in-a-Box

System 2000 is an electronic medical library and records-keeping system, storing up-to-date information from 12 medical textbooks and 1,100 medical journals. Physicians can retrieve information within seconds by entering Greek or Latin subroots or key words describing a patient's symptoms. Prototypes of the system will be installed in several private practices – at the Occupational Health Clinic in NASA headquarters in Washington, DC, and at the Kennedy and Johnson Space Centers in early 1995. For more information: +1 (904) 592 4571. – *Katrina Holden*

A Day Without *Boiled Angel*

Is Like a Day Without Sunshine

► ing bone to the digital masses after his party won control of Congress. He proposes that all committee reports and other government info generated in Congress's daily work be "electronically available" at the instant it is released, so that "every American everywhere in the country has the same access as the lobbyists, has the same opportunity as the insiders, and that information is available automatically for free to the entire county when it's made available to the members of Congress." Sounds great, Newt. But we already know what you'll say when it comes to actually doing this: "Oh, gee, you mean ►

Dancing with DKT3

(tap-tap-tap)

Walking back to my cube I caught the top of David over there looking at me. Now I can feel my pulse in my ears

Sent by: DKT3
What were you smiling about?

It was just his head: it was just all of his head looking at me, the eyes not blinking. It was Humpty-Dumpty with red wild and thinning hair sitting on a cubicle wall staring me down.

I felt like prey.
(I ran behind a tree.)

This sport, this Protean sport, it goes on not only in these aisles, behind these low bogus walls, but also along the phone lines, the current streaming out of our fingertips.

i didn't realize i was smiling.

It sounds like taptap taptaptap and it is a dance. It is the electronic cubicle dance, and it is or will soon be done everywhere. Certainly at Autodesk. (Probably not at Microsoft.) (Across the surface of the earth

there are rayon-sheathed lovers sitting a few feet apart in large square buildings, and the lovers are exchanging electronic love letters.)

Sent by: DKT3
One of your many beauties...

You and I, we dance together along the miles of gray aisles. We dance on a floor on top of another floor on top of fifty more. We are a violently beating heart, we are cowards with hard-ons channeling ourselves into tiny wires.

That is how life is now.

– *Lisa Cullen* (laughter@netcom.com)

One of the best ways to boost a publication's sales is to get it censored. *Boiled Angel* is a perfect example. "My publisher is selling more copies than ever," says creator Michael Diana. "Now they have them in stores."

Twenty-five-year-old Diana holds the honor of being the first cartoonist in America to be convicted on obscenity charges. His comic book, *Boiled Angel*, graphically depicts serial slayings, date rapes, and priests engaged in pedophilia. Government officials in Florida, offended by the comic book, set up a sting operation in 1992 to get Diana. An undercover agent, posing as a fan, ordered *Boiled Angel* through the mail. It took the agents two years to send Diana a summons to appear in court on charges of publishing, distributing, and advertising obscene materials.

The trial was held in Pinellas County during March 1994. The prosecution hired a crack team of expert witnesses to present its case. Two were professors from Eckerd College who claimed that *Boiled Angel* was void of artistic or literary merit. Expert psychologist Sidney Merin testified that *Boiled Angel* appealed to "deviant groups," including the "fringe element," the "bizarrely unstable," and "those who have a libertine bent in their thinking."

The jury deliberated for two hours and

returned a guilty verdict. Meanwhile, Diana spent three nights in jail in the Pinellas County's maximum-security unit awaiting sentencing. He received three years' probation, was ordered to perform 1,248 hours of community service, pay a US\$3,000 fine, complete a psychology evaluation at his own expense, and take a course in journalism ethics, also at his own expense. But the shocker was Judge Walter Fullerton's decree forbidding Diana from drawing anything, even for his own personal use, that the judge might consider obscene.

The case is on appeal. In June, Diana paid the court US\$3,000 (given to him by the Comic Book Legal Defense Fund, which is funding his defense and his appeal) to postpone his probation until after the appeal.

Diana was pretty bummed, especially about the community service part of the sentence. "I don't like working for free," he said, but added: "The notoriety was worth the hassle."

And the court's attempt to keep him from drawing whatever he wanted was useless, Diana says. "I kept my drawings hidden, anyway." – *Mark Frauenfelder*

***Boiled Angel*: US\$6.66 each. Michael Hunt Comix: Box 226, Bensenville, IL 60106. +1 (708) 794 2723. Comic Book Legal Defense Fund: (800) 992 2533, +1 (413) 586 6967.**





Return to Zork
Activision



Star Control II
Crystal Dynamics



Elder Scrolls Arena
Bethesda



Super Street Fighter
Capcom



Fighters History
Data East



Alien vs. Predator
Atari



Contra Hard Corps
Konami



Lands of Lore
Westwood



The 11th Hour
Virgin Games



Flashback
U.S. Gold



Return to Ringworld
Tsunami



Hell
Take 2 Interactive



Lufia - Fortress of Doom
Taito



Dark Sun
SSI



Outpost
Sierra On-Line



X-COM
Microprose



Star Trek: The Next Generation
Spectrum Holobyte



Disciples of Steel
MegaSoft



Star Wars Rebel Assault
LucasArts



Jungle Strike
Electronic Arts



Brutal Paws of Fury
Gametek



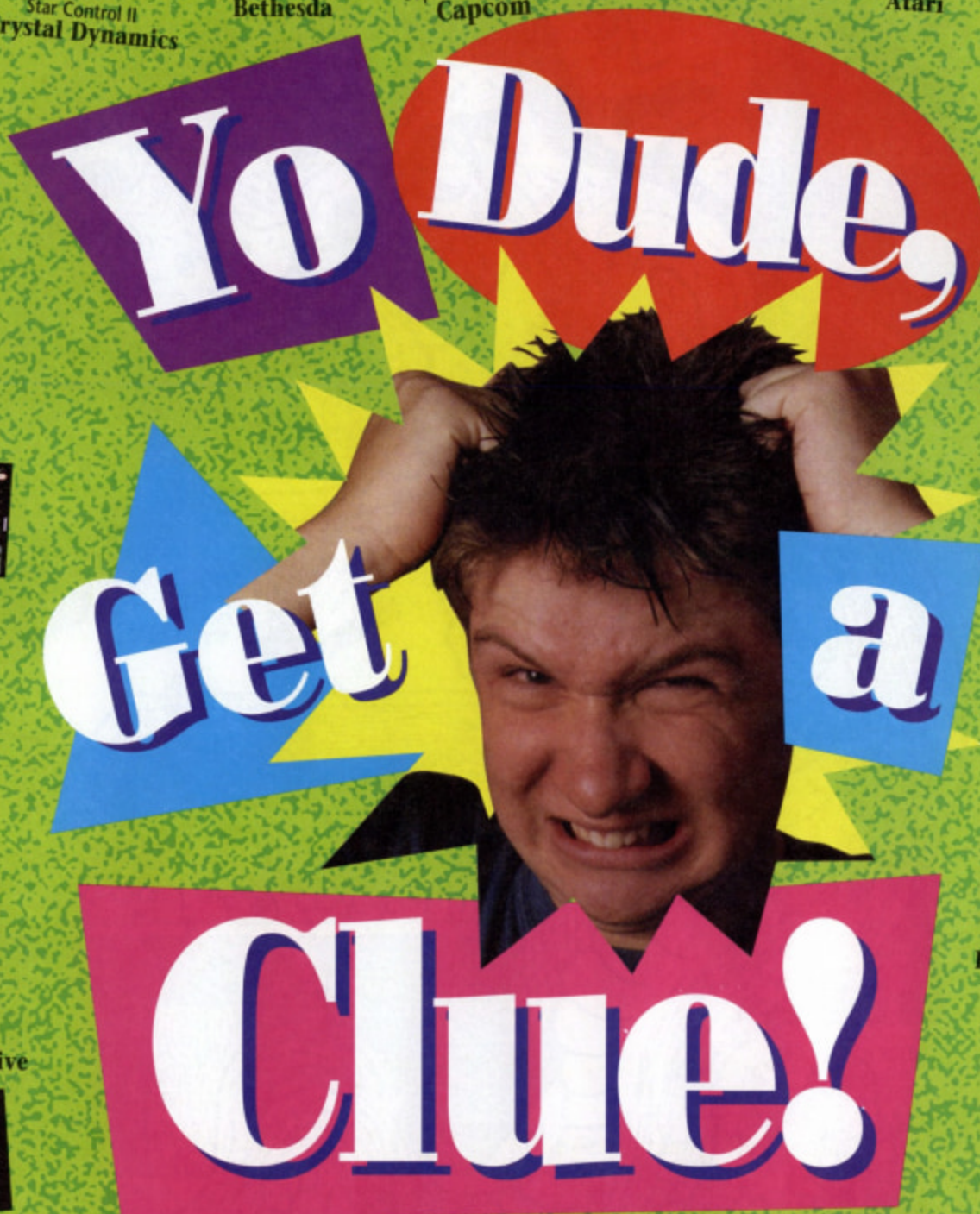
Stonekeep
Interplay



Vortex
Electro Brain Corp



Heimdall
JVC Musical



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AAAAH!

Don't Be a Clueless Loser!

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Out!

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Capcom

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Crystal Dynamics

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Data East

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65 cents to 95 cents per minute

Electro Brain Corp.

1 900 903-TIPS
99 cents per minute

Electronic Arts

1 900 288-HINT
95 cents 1st min., 75 cents add'l minute

GameTek

1 900 903-GAME
80 cents per minute

Interplay

1 900 370-PLAY
\$1.25 1st min., 75 cents add'l minute

JVC Musical

1 900 454-4JVC
75 cents per minute

Konami

1 900 896-HINT
85 cents to \$1.15 per minute

LucasArts

1 900 740-JEDI
75 cents per minute

MegaSoft

1 900 454-6888
95 cents per minute

Microprose

1 900 933-PLAY
95 cents per minute

Sierra On-Line

1 900 370-KLUE
75 cents per minute

Spectrum HoloByte

1 900 773-HINT
95 cents per minute

SSI

1 900 737-HINT
95 cents 1st min., 75 cents add'l minute

Taito

1 900 28-TAITO
75 cents to \$1.25 per minute

Take 2 Interactive

1 900 28-TAKE2
95 cents to \$1.25 per minute

Tsunami

1 900 903-WAVE
80 cents per minute

U.S. Gold

1 900 288-GAME
85 cents per minute

Virgin Games

1 900 28-VIRGIN
75 cents per minute

Westwood

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75 cents per minute

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Plastic Man

Judging by the tools he uses – 3-D scanners, computer-controlled milling machines, Silicon Graphics hardware, and 3-D CAD software – Dan Collins could pass for an industrial designer. On the other hand, the types of data he works with – anthropometric, topographical, meteorological, and CAT scan – could lead you to believe he is a sort of high-tech conspiracy theorist tracing elusive symmetries among sets of data.

In fact, Collins is a sculptor and professor of art at Arizona State University. He has sought out increasingly sophisticated technology to facilitate his exploration of new forms. "We are stuck in a silver-gelatin, two-dimensional world of representation," Collins says. His latest work involves scanning himself, then manipulating the resulting 3-D model, distorting it or merging it with other data, and producing a hard copy by machining a block of material with a computer numerical control mill. – *Seth Rosenthal*



► it's gonna cost *money*?" Case in point: 1993 House legislation that mandated its Legis online service be opened up to the public. So far, nothing's happened. Why? No funding. ☹️ Mourning Cantwell: The GOP landslide swept aside Rep. Maria Cantwell, the feisty freshman who spearheaded the fight against Clipper in Congress last year. Her replacement, Republican Rick White, thinks loosening export controls on encryption technologies threatens national security. ☹️ Net.News: The Internet Society reports a third-quarter 1994 net.growth of 21 percent. That's even faster

than the explosive growth of the past four years. The .net domain, which is used by most commercial service providers, is growing at an astounding 66 percent. Based on these figures, the society projects the number of Internet hosts will grow to 100 million by 1999. Also of note are the fastest-growing domains by country: Argentina (from 248 to 1,287), Iran (from 4 to 14), and Peru (from 42 to 114). The US grew from 16,556 to 24,861 total net domains. For all the facts, <ftp://ftp.isoc.org/isoc/charts/hosts3.ppt>. ☹️ FedEx.com: Look for both FedEx and UPS to be online in the near future. The competing package-delivery services will create areas on CompuServe and Prodigy (UPS), and AOL and CommerceNet (FedEx) in the coming months. ☹️ Only 11

The Sound of Concrete Screaming

Building engineers, taking a cue from nature, are beginning to equip the steel and concrete flesh of the constructed world with "nerves" made of glass fibers. These nerves can signal dangerous conditions such as microcracks, excessive strain, or high alkalinity corroding the concrete's reinforcing bars. Engineers can send light through the fibers and watch for changes in color, intensity, and phasing.

Peter Fuhr and Dryver Huston, professors at the University of Vermont, have fitted several structures with optical fibers, including a new science building on their Burlington campus, a hydropower plant on the Winooski River, and resurfaced bridge decks in neighboring areas.

A telemetry system sends structural stress data from the optical fibers in a Middlebury bridge to a computer in the researchers' labora-

tory. As Fuhr sees it, these kinds of early efforts could lead to "sensitized" cities in which a few people sitting in the cool monitor-glow of an office can track the health of all the major buildings and structures.

Making real this vision of intelligent structures will take some doing, Fuhr cautions. On his wired bridges, he says, "you can tell if trains are on schedule, but most of the stress data is rubbish," meaning they are impossible to interpret just yet. Ironically, the biggest hurdle may come from the construction industry, which Fuhr and others say is loathe to deviate from traditional building codes that do not call for concrete and steel with fiber-optic nerves. For additional information, visit the University of Vermont's Optic Research Lab Web Site: <http://issri.emba.uvm.edu/>.

– *Ivan Amato*



TIRED

Cable
Rupert Murdoch
Eightball
Democrats
Jerry Seinfeld
Aerobics
Books
Kevorkian
Manhattan
Mortal Kombat II
Microsoft Network
SyQuest
Intuit
Peter Lewis
How To Make a Fortune on the Information Superhighway



WIRED

Direct Broadcast Satellite
Conrad Black
Acme Comics Library
Anarchists
Garry Shandling
Yoga
Books on tape
Heimlich
London
Donkey Kong Country
The Web
DynaMO
DigiCash
Brock Meeks
Speed Tribes



When a state government announces that it is bringing the Net to the people for the price of a local call, you've got to ask two questions: What parts of the Net? and How much

Sailor's users don't need an account or a password.

And the price? The federal government is kicking in almost US\$2 million of everybody's money, spread over two years. This isn't

lander (it is not known how many have modems) – from the state legislature to run it and expand it. Marylanders who cannot live without e-mail, ftp, telnet, newsgroups, and all the

only 192 dial-up connections for the whole state, providers figure the first to desert will be frustrated would-be Sailors fed up with busy signals. The annual cost of the cheapest

The Maryland Net: Almost Free, Almost Good

is it really going to cost? Maryland's Sailor gopher, a statewide freenet, contains an evolving mix of state and federal government information and library catalogs – just the kind of tedious, lackluster flapdoodle people now schlep to libraries to look up. Sailor's magic menu item, however, is "Search the Internet."

new money from a suddenly generous US Congress. The source is a long-standing US Department of Education program to help libraries construct new facilities.

The start-up money will be gone by September 1995, when Sailor's captains hope to have pried \$885,000 – around 17 cents per Mary-

other toys will be able to add them for just \$100 per year.

Are commercial Net access providers peeved that the government is hornning in on the action? Not a bit. They figure that once people get their feet wet with Sailor, they'll want more. Because the Maryland system currently offers

commercial full Net connection is only \$20 or so more than what Sailor is planning to charge. The providers also expect to inherit a flood of former novices who are eager to move on to Mosaic and other entertainments. To check out Sailor, gopher to sailor.lib.md.us.

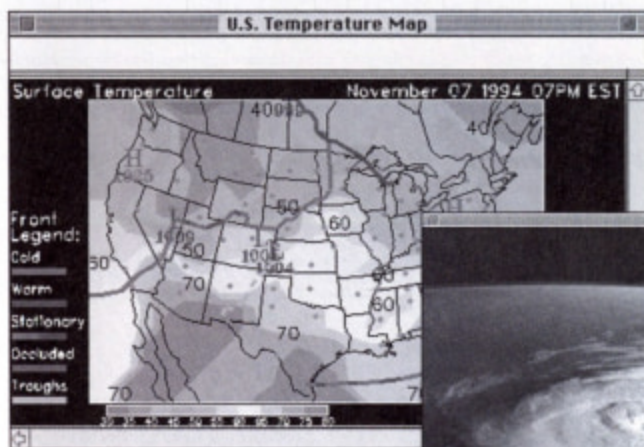
– *Tabitha Powledge*

Months Till 1996: Microsoft anticipates 30,000 customer-service calls a day once it releases Windows95, its "easy to use" operating system. The company has contracted with five separate customer-service providers to handle the deluge. Is it just us, or is Microsoft not quite certain how "easy to use" Windows95 really will be? **III Watch Yer Ass, Bill:** The combo of Microsoft, the yet-to-be-beta Microsoft Network online service, and Intuit may have given the fossilized banking system a wake-up call. A senior vice president of electronic banking at Meridian Bancorp Inc. told *BusinessWeek* that "Not all dinosaurs roll over and die. Some of 'em can run real fast and bite the hell out of you." Meanwhile, America Online's Steve Case whined recently that ▶

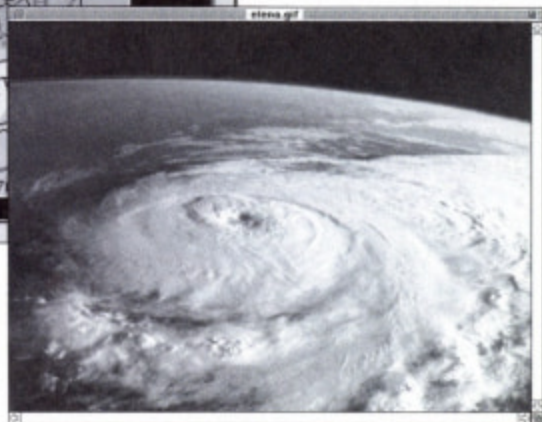
Blue-Skies, a program written by University of Michigan student Alan Steremberg, offers Internet users graphical weather updates. You move the cursor across the map, and as it passes over, say, Denver, you get the weather for that city. Or double click on a town to get a full report. Other tools let you expand the map or cut part of the image.

Blue-Skies incorporates a file transfer protocol based on gopher. Whereas the Web mostly links images to text, *Blue-Skies* links text to images. The text, in this case weather data, is attached to a point on the screen.

Information on ozone holes, air pollution, and storms, as well as QuickTime movies of weather animations, can be downloaded using *Blue-Skies* as well. Get the software via ftp from madlab.sprl.umich.edu in the pub/Blue-Skies directory. – *Steve Cisler*



Data Storm



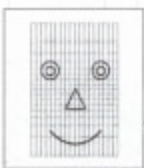
The Plan



Orthographic Projection



Mercator Projection



Optimal Conformal Projection



The World's Most Accurate Map

The *Oxford-Hammond Atlas of the World* claims to contain the first maps created directly from a satellite-generated digital database. The key figure in the atlas conception is mathematical physicist and chaos-theory trailblazer Mitchell Feigenbaum. He wrote software using fractal geometry capable of reconfiguring coastlines, borders, and mountain ranges to fit a multitude of map scales and projections.

Mapping a sphere on a plane inevitably distorts shapes, distances, or areas. Most maps try to preserve either true area relationships (equal

area projections) or true angles and shapes (conformal projections), or to create a balance between the two. For this atlas, Feigenbaum created a new map projection, now known as Hammond's Optimal Conformal, which the publishers claim is "the most distortion-free conformal map possible and the most accurate projections that have ever been made."

The high quality of the graphics and production of this striking new atlas will catch consumers' interest. The price is US\$69.95, Hammond Incorporated: (800) 526 4953, +1 (201) 763 6000. — John May



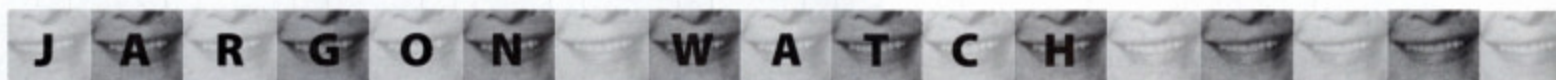
► "Microsoft should show some restraint and not try to leverage its operating system" as the de facto window into the online world. "Show some

restraint." ■■■ PCTV Trivia: The Electronic Industries Association reports that personal computers accounted for US\$8 billion in gross sales in 1994 —

that's \$500 million more than sales of color televisions for the same period. ■■■ Mighty Morphin' Power Legislators: You know that really dumb show

in which blow-dried teenagers in shiny spandex fight off stuntmen in ridiculous alien monster rubber suits? It's called *Mighty Morphin' Power Rangers*

and it's the *Speed Racer* of the '90s — kids eat it up like *Coco Puffs*. Only those francophile Canadians have banned it because violence in the show does ►



8th-Floor Decision

Refers to the 8th floor at the FCC, where the commissioners' offices and meeting rooms are located. Decisions made on the 8th floor have a profound effect on new communication services.

In the Demo

MTV corporate slang for being a member of a targeted demographic group.

Small Indulgence Syndrome

Spending money on small luxuries and frivolous purchases when hard economic times prevent purchasing big-ticket items such as cars, houses, and expensive vacations. Coined by cultural trend watcher Faith Popcorn.

SloGo

Short for Slogan + Logo. Corporate slogans used repeatedly, in a manner similar to a logo. Nike's "Just Do It" and AT&T's "You Will" are prime examples.

Cold Peace

A relationship between two countries in which there is no war, no trade, no travel, and no diplomatic relations.

Media Contamination

Used by LA Superior Court Judge Lance Ito in the possible tainting of the O.J. Simpson jury by exposure to media coverage.

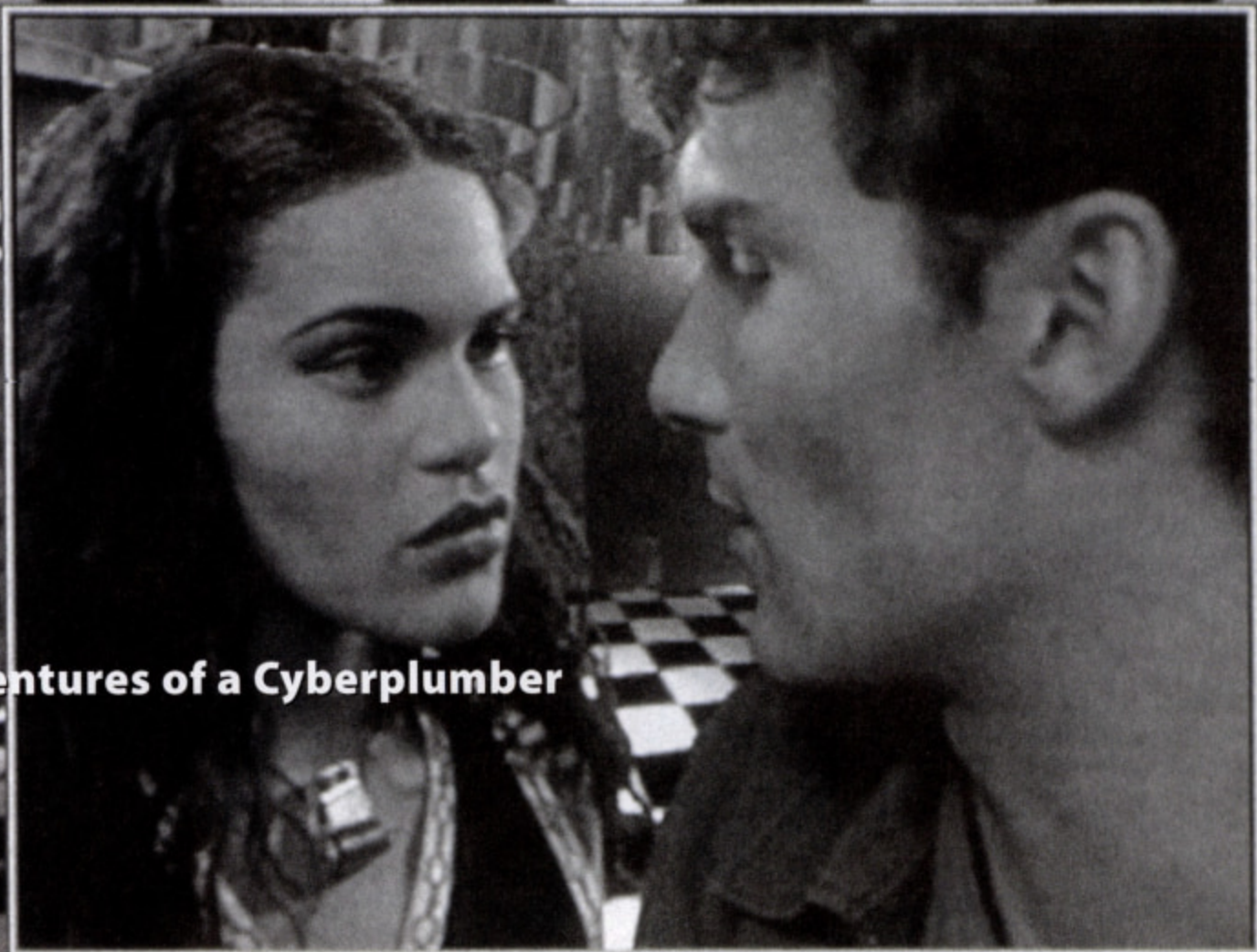
J-list

Shorthand/lazy Netspeak for "journalist."

404

Someone who's clueless. From the World Wide Web error message "404, URL Not Found," meaning that the document you've tried to access can't be located. "Don't bother asking him ... he's 404, man." — Gareth Branwyn

A tip o' the fez to: Hugh Brackett, Justin Hall, Will Kreth, artturner, Robert Lauriston, Brock Meeks.



Adventures of a Cyberplumber

"*Club Dead* is a total melding of live-action filmmaking and digital imaging," says game director Greg Harrison, describing MTV's first CD-ROM, released in November.

Harrison, who was part of the design crew of *Pee Wee's Playhouse*, teamed up with Chicago's H-Gun Labs (see *Wired* 2.09, page 32) to create a film noir murder mystery

CD-ROM for MTV/Viacom New Media. The player in MTV's *Club Dead* assumes the role of Sam Frost, a cyberplumber who troubleshoots high-tech computer equipment in Alexandria, a floating Arctic resort. When resort guests start getting bumped off, Frost has to hunt down the killer within four days.

Harrison says the game is a slice of real life: "If you do something wrong early, miss somebody you were supposed to meet, or don't pick up a piece of gear you need — you're going to screw up later."

With an eye to the future, Harrison is writing a script for a feature film, *Brickface* and *Stucco's Big Block*, *Bone-Jar-*

ring, *Turbo-Terror*, *Fuel-Injected Joyride*, and is wrapping up a short for Nickelodeon he says is called *Adventures of Patch Head*. "It's a tale of an 8-year-old hillbilly kid who wears half a watermelon on his head and rides a Big Wheel powered by a V-8 engine." Viacom New Media: (800) 469 2539, +1 (212) 258 6000. — John Sarvay

When Oklahoma Information Exchange BBS operator Anthony A. Davis was convicted on five counts of obscenity in 1993, civil libertarians said it was a wake-up call for sysops. But that isn't much of a consolation to Davis, who faces 10 years and a US\$10,000 fine unless he wins his appeal.

Bill Holmes, Davis's attorney in the district court trial, says the

ledge of the information, such as the bestiality scenes, that were on some of the CD-ROMs on his system. "Only a tiny proportion of this legitimate bulletin board system was dealing with adult material," he said. "This is a family man with no prior serious convictions."

And third, Holmes alleges, the search that officers conducted in July violated Davis's right under the

obtain a warrant, due to ECPA.

Davis has filed a federal civil rights lawsuit against the Oklahoma City Police—he is asking for more than \$1 million in damages. He could use the money if he wins: his appellate representation will be by a public defender. Although Holmes won't be representing Davis on the appeal, he is sticking with him on the federal case.

Oklahoma: Land of the Squeaky Clean CD-ROM

appeal will likely focus on three issues. First, a technicality in Oklahoma's criminal pornography statute fails, in defense eyes, to include computer-generated images. "Mr. Davis is more the victim of the first case of its kind than a dangerous criminal," asserts Holmes. Secondly, the attorney argues, Davis did not have know-

federal Electronic Communications Privacy Act (ECPA). Police claim that while the warrant permitted only the seizure of CD-ROMs, officers spotted an obscene image on a computer screen during the search in Davis's Oklahoma City home. This spurred them to seize the entire BBS hardware, an action for which it would have been very difficult to

Free on bond, Davis is broke and bitter. The wounded Vietnam vet faced a jury that included two ministers and a conservative talk-show host, and stood before a judge who ignored the corrections department's recommendation of probation. Davis's only comment to *Wired* was "I don't want to talk about it anymore." — Doug Fine

► not contribute to "the development of either plot or characters." In fact, the Canadian Broadcast Standards Council

insists, "violence is depicted as the only method of resolving conflict." Memo to the writers at *Mighty Morphin' Power*

Rangers: add this line to each episode: "C'mon guys, let's go kick some rubber space-alien butt." That oughta pass

muster as "plot development." ■■■ One more look: First reader to guess the secret code on our cover this month wins a

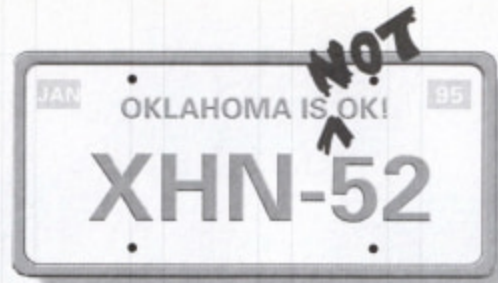
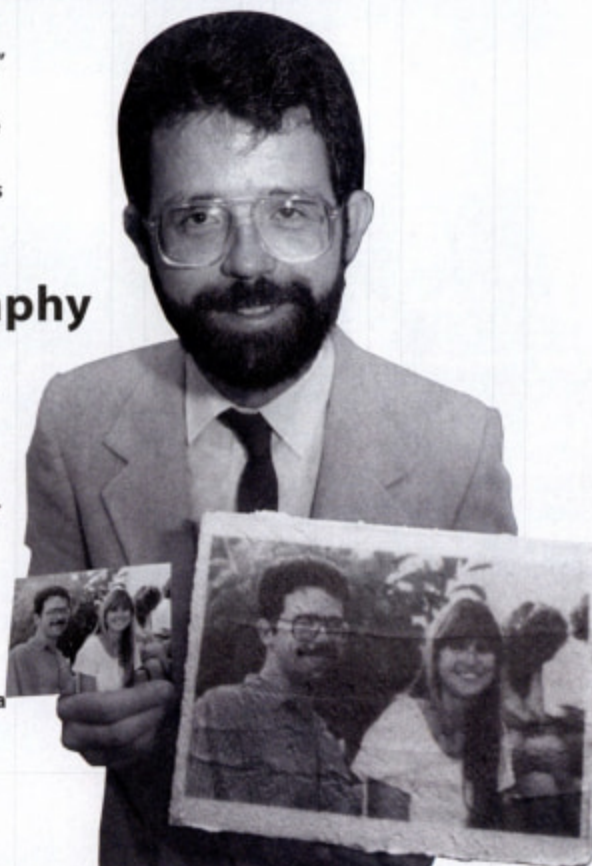
free subscription and a trip to your local CompUSA to find out why we had to make it a secret in the first place. ■■■

It's like a Xerox machine for food," says California inventor John Kitos of his creation, Decorate. The machine scans color images and paints them on white frosted cakes with near-photographic quality resolution.

Edible Photography

Decorate, approximately US\$18,000, is based on a 386 computer, a color scanner, and a custom painting unit that squirts edible food dye. The painting unit is "halfway between an inkjet printer and an air brush," Kitos explains. Refill cartridges, holding enough dye for about 40 cakes, cost approximately \$40.

And cake isn't the only thing Decorate can paint. Any food with a flat smooth surface will serve as a canvas. — Dave Cravotta



WIRED TOP 10

Best-selling CD-ROMs at the Government Printing Office (fiscal year 1993)

1. Safety Regulations

OSHA Regulations, Documents, and Technical Information. US\$30/quarterly issue.

2. Current Federal Laws

US Code on CD-ROM. US laws in effect as of January 2, 1993. \$36.

3. Biotechnology Database

ENTREZ. Biotechnology database of nucleotide and protein sequences with MEDLINE citations. \$25/bimonthly issue.

4. Latest Regulations on Federal and Defense Acquisitions *Federal Acquisitions Regulations (FAR)*, *The Federal Information Resources Management Regulation (FIRMR)*, and *The Defense Logistics Agency Acquisition Regulation (DLAR)*. \$33/quarterly issue.

5. Toxic Chemical Inventory

EPA Toxic Chemical Release Inventory, Title 3, Emergency Planning and Community Right-To-Know Act of 1986, 1987-1990 Inventories and Chemical Substance Fact Sheets. No longer available. Out of print. New 1994 edition \$33.

6. Arkansas Land Records

General Land Office Records: Arkansas. \$15.

7. Federal Tax Forms

1993 IRS Federal Tax Forms: Including Non-Calendar Year Products. No longer available. New 1994 edition \$69.

8. Medicare and Medicaid Manuals and Laws

Health Care Financing Administration's Laws, Regulations, Manuals. \$30/monthly issue.

9. Health Statistics

1990 National Ambulatory Medical Care Survey. Survey of health statistics provided by physicians in private practice. Out of print.

10. Selected State Department Information

US Foreign Affairs on CD-ROM. \$29.

SOURCE: Government Printing Office's Electronic Information Dissemination Services (EIDS) department. Phone: +1 (202) 512 1530, e-mail: help@eids05.eids.gpo.gov. — Gareth Branwyn

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COMING SOON!

Hanna-Barbera

Future Pirates, Inc.

AN INTERACTIVE CD-ROM FOR MACINTOSH

COMING SOON!

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Doc and rid yourself of this binary bacteria before your head explodes and you end up decorating the

entire room with your cerebellum.

And the good news?

Gray matter doesn't stain.

Philips Media



You have exactly two hours to find

into your skull.

loaded a particularly repugnant little cyber-virus called "Burn:Cycle"

It's an infection.



Your name: Sol Cutter. Occupation:

data thief. The bad news is you've just down-

coming soon
MAC & PC CD-ROM

CD-i



PHILIPS

Trike for Tykes

When a designer for mountain-bike maker Cannondale built a nifty little mountain trike for his kid, everyone who saw it wanted one too. So Cannondale produced the Heir 'dale, a low-maintenance aluminum tricycle with a front-wheel drive that eliminates the need for a chain. Cannondale claims the drool-resistant rubber grips also withstand aggressive teething. And if the aggro tot wants to hit heavy terrain, ask Cannondale to outfit a pink or electric baby-blue model with a heavy-duty front shock fork. Heir 'dale: US\$199. Cannondale Corp.: (800) 245 3872, +1 (814) 623 2626.



The NoteJet II 486C

One of the most important elements of your communication system – the printer – usually gets left at home when you travel. Canon takes care of this problem with the NoteJet II, a 486 color laptop with a bubble-jet printer built into the computer. The NoteJet II weighs under 10 pounds, making it the fetish of choice for globe-trotters everywhere. Optional fax and communication packages are sold separately. NoteJet II 486C: US\$2,999 with 130 Mbyte hard drive, \$3,199 with 260Mbyte hard drive, \$3,599 with 340 Mbyte hard drive. Canon Computer Systems, Inc.: (800) 848 4123, +1 (714) 438 3000.

F E T I S H

Edited by David Jacobs

Better than Dilithium Crystals

When you need to be productive on long flights, you'd better pack a bunch of extra laptop batteries in your briefcase. Or you can bring along the new AER Energy Power 220. This bizarre-looking cube uses a rechargeable zinc air cell that sucks up oxygen as it delivers electricity, giving the average consumer up to 10 times the use of other batteries. It'll even supply some extra juice to power your cellular phone simultaneously. AER Energy Power 220: US\$649. AER Energy Resources, Inc.: (800) 769 3720, +1 (404) 433 2127.



Rumble Seat

The next time you play on your favorite simulator, take your mind and body along for the ride. The ThunderSeat, designed for the US military, has a built-in wave chamber and 100-watt subwoofer speaker that pumps the roar of a jet engine or the rumble of a Sherman tank (or anything else coming out of your PC sound card) into your bones. Mix business with pleasure via Rolling Thunder, a ThunderSeat mounted on an office chair base (US\$295). ThunderSeat Ace: \$159.95. ThunderSeat: (800) 884 8633, +1 (310) 410 0022, fax +1 (310) 410 1569.

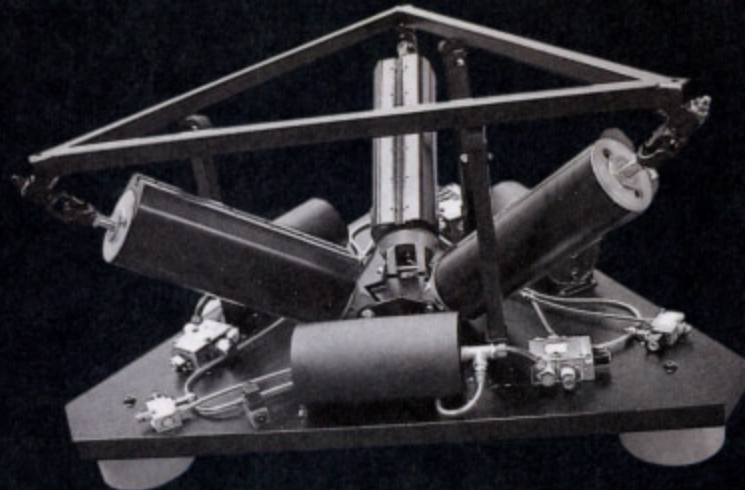


Behind the VR Curtain ▶

Building simulated worlds is more than just hacking great code. You need hardware your body can interact with. Denne Developments Ltd. makes the best direct-drive electromagnetic actuators, called PemRAM, for theme-park rides and flight simulators. The air-suspended actuators use no gears, motors, ball screws, or hydraulic fluids, so the response is almost instantaneous. The high bandwidth lets you add vibration, such as engine noise, to the experience. Put one in your living room and take friends for a ride they'll never forget. PemRAM 3-Axis Motion Base: US\$25,000. Denne Developments Ltd.: +44 (1202) 861661, fax +44 (1202) 861233.

Six Shooter

If you're a CD-ROM jockey, the Pioneer DRM-604X will sextuple your information capacity. The 604X is a quad-speed CD-ROM drive that holds up to six discs in a fast-spinning magazine. You ▶ can have the Oxford English Dictionary, the national Yellow Pages, and four other titles at your fingertips. If you run out of space, try the DRM-1804X, which holds up to 18 discs. DRM-604X CD drive: US\$ 1,395; DRM-1804X: \$2,495. Pioneer New Media Technologies, Inc.: (800) 444 6784, +1 (310) 952 2111.



In Your Face

Who needs emoticons when you can send an image of your real face over the wires? The Logitech VideoMan is the first color digital-video camera for the personal computer. It sits next to your computer monitor on an extendible arm, so it can focus on anything you want to show your video-conferencing pal. With an adjustable focal distance of an inch to infinity, a built-in microphone, a 640 x 480 pixel image, and a 30-frame-per-second operation, the VideoMan is an elegant replacement for ◀ an analog-video camera and the signal conversion hardware typically needed for digital-video applications. VideoMan: sold to system integrators, VARs, and OEMs; US\$279. Logitech: (800) 231 7717, +1 (510) 795 8500.

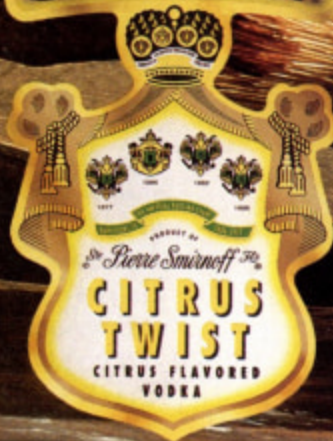
Cyborg Alert: A Wearable Mouse

Tired of being grounded in two dimensions with your mouse or trackball? Point your way into cyberspace with the Ringmouse. The two-button device slips on your right or left index finger and uses infrared and ultrasonic tracking technology to control the cursor. RINGMOUSE is great for 3-D games. It saves valuable desktop ◀ real estate, too. Spectrum's 3-D Wireless Ringmouse: US\$99.95. Kantek Inc.: (800) 536 3212, +1 (516) 593 3212.

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PURE TWIST.

SMIRNOFF

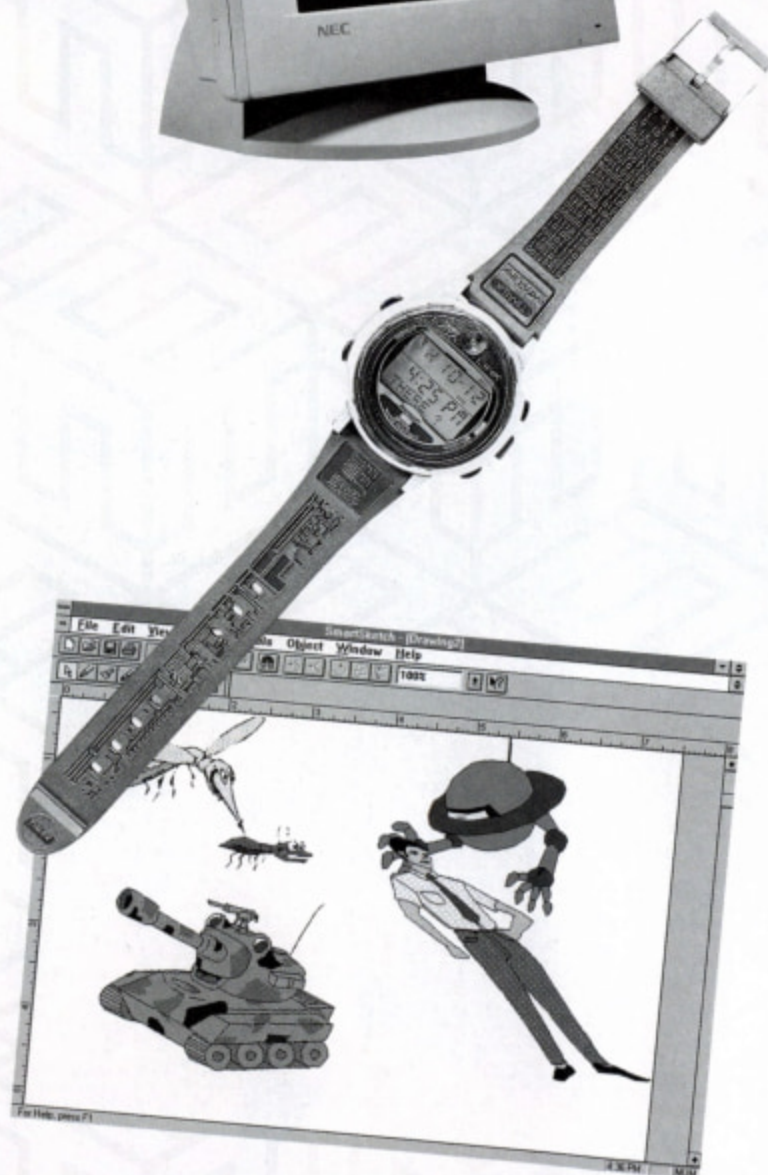


Narrow View

Like a limited-production sports car, NEC's sleek LCD1280 monitor is made to order. Taking up a small footprint on your desk, the monitor has an active 13-inch display area and state-of-the-art thin film transistor LCD technology, providing a crisp 24-bit display resolution of 1280 x 1024 without the distortion at the edges of a standard monitor display. With a maximum power consumption of only 45 watts, you can be both leading-edge and green. LCD1280 monitor: US\$11,755. NEC Technologies, Inc.: (800) 632 4636, +1 (708) 238 7800.

Smart Sketch

Here's something I've been waiting for: a fast, easy-to-use drawing program that's as fun as using traditional artist's tools, but as convenient as working in the digital realm. SmartSketch has many of the same functions as a raster-based paint program – such as erasing any part of your drawing – but saves files in vector format, so your work prints out free of jaggies at any size. If you have a pressure-sensitive stylus, you can easily vary the width of lines so your drawings don't look like they were composed on a \$10 Etch A Sketch. SmartSketch for Windows: US\$99. FutureWave Software, Inc.: (800) 619 6193, +1 (619) 637 6190.



Wear Your Life on Your Wrist

Data watches have long been a joke. Either you have to enter all the information into your watch via a tiny keypad, or you have to dig out a cable to connect the watch to your PC. But now, with the Timex Data Link, you can transfer appointments, phone numbers, contacts, and memos to your watch simply by holding the watch face up to the computer monitor. I use the Data Link to zap reminders onto my wrist before every trip. Timex Data Link: Approx.

◀ US \$130. Timex Corp.: (800) 367 8463, +1 (501) 372 1111.

Robo Navigator

Nothing's worse than being late for a meeting and getting hopelessly lost. If you owned AudioNav from Amerigon Inc., you'd be there by now. AudioNav is a car navigation system that responds to your spoken commands with audio directions. About the size of a textbook, AudioNav connects to your car's CD player. Digital map data on a CD-ROM shows the best way between where you are now and where you were supposed to be 20 minutes ago. This is a must for anyone who's always late, always lost, and always explaining.

◀ AudioNav: Approx. \$US550. Amerigon Inc.: +1 (818) 932 1200, fax +1 (818) 932 1220.

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Apple Peripherals



Over the years, the myth has arisen that only scientists and the artistically inclined need big screen displays. The fact is, anyone whose work requires a lot of scrolling around (like Gloria Joyce) will get more done with an Apple® Multiple Scan Display. The Multiple Scan 20 Display, for instance, lets you see two pages at a time, whether it's a magazine layout or Columns A to Z on your spreadsheet. And the Multiple Scan 17 Display has a full 70% more viewing area than a 14-inch screen. Better still, both the 20- and 17-inch displays use state-of-the-art Trinitron® technology, resulting in a noticeably

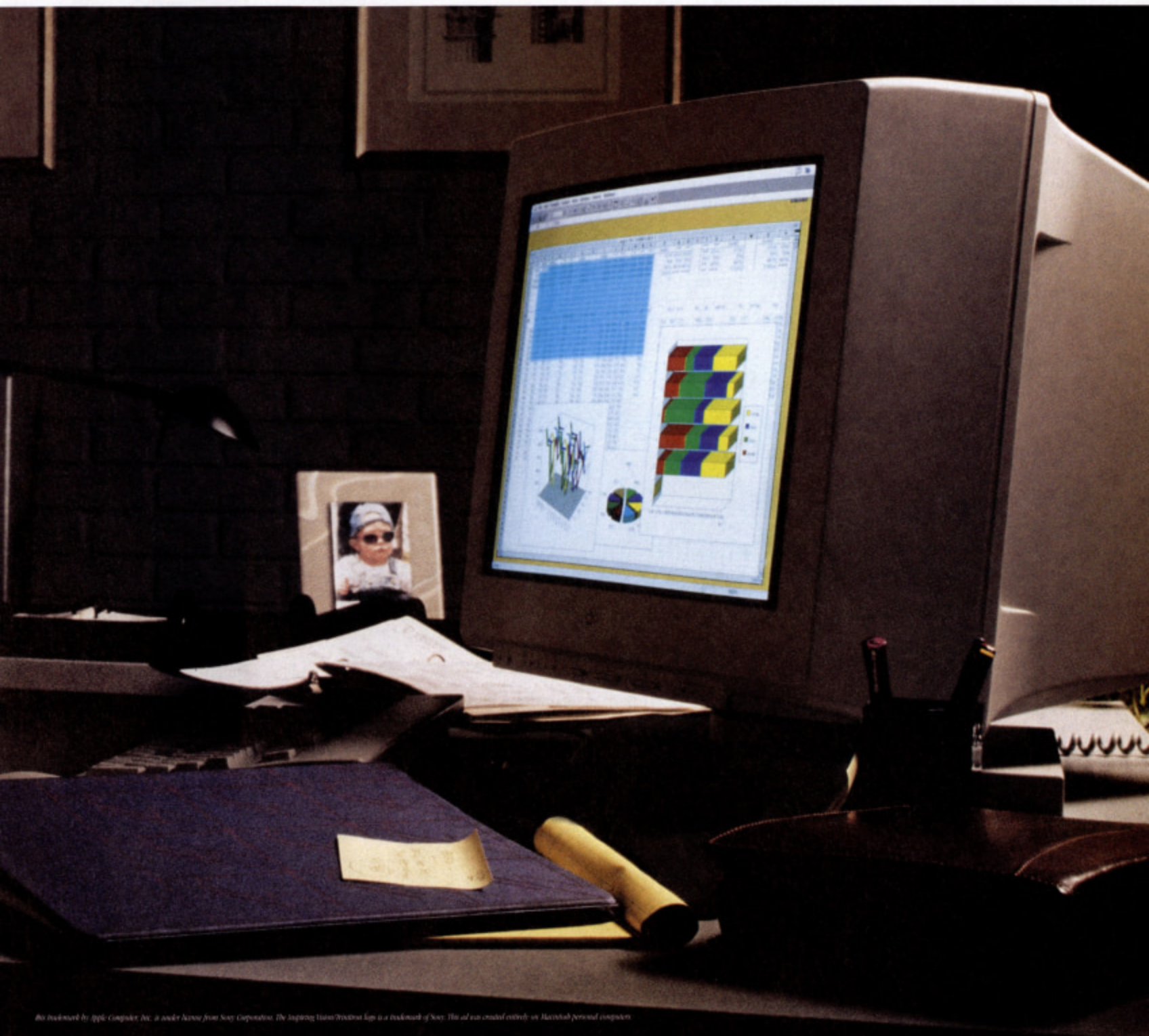
The large, high-resolution picture is perfect for designers, art directors and engineers.

Not to mention Gloria Joyce, who can finally see all 26 columns of her spreadsheet simultaneously.



Apple Multiple Scan Displays

brighter, sharper picture. To prevent eyestrain, each 75 Hz screen is specially coated to reduce glare and static. The flat screen shape minimizes distortion and reflections from office lights. Another plus: quick resolution switching, which lets you enlarge images to fill the screen (perfect for graphics and multimedia professionals) or shrink images and see the big picture (perfect for — well, everyone). Of course, Apple displays are designed to work seamlessly with Macintosh® computers. We've also included a PC adapter, allowing PC users to enjoy the same plug-and-play compatibility. So no matter who you are, you can see all of what you're working on. Which is a pretty smart way to work.



The Future of Food

You've heard the hype. We asked the experts. Here's the real timetable.

A family of four in the United States spends almost US\$5,000 each year at the grocery, according to the Food Marketing Institute. That money trickles through an industry that is undergoing radical change. The food industry is being pushed by an ever-expanding world population and pulled by new technologies. While the future of food won't be

the cannibalism of *Soylent Green* or genetic mutants of *Attack of the Killer Tomatoes*, advances in farming and biotechnology are bringing new innovations closer to our refrigerators. Hungry for answers about the next millennium's dinner, *Wired* asked five experts to predict when drastic changes within the four food groups may occur. — David Pescovitz

	Most US Produce Grown Hydroponically	Superpreservative	Aquaculture	Food Tablet	Most US Produce Genetically Engineered
Mahmoud El-Begearmi	2000	never	1997	never	1998
Manfred Kroger	2085	never	2025	1995	1960
Pam Marrone	2020	2050	2050	2040	2020
Ellen Martin	2100	never	2000	never	2015
Jim McCamant	never	never	2030	2010	2030
Bottom Line	2051	never	2020	2015	2004

Mahmoud El-Begearmi
PhD, nutrition and food safety specialist, University of Maine Cooperative Extension

Indoor hydroponic gardening allows crops to be grown anywhere year-round by using a nutrient-rich water bath rather than soil. Kroger, who notes that he's "been eating hydroponic lettuce for 20 years," predicts the building of large-scale hydroponic "skyscrapers" in the next century as suburbia spreads further into farmland. McCamant, however, thinks hydroponics will never take off on a large scale because "it's always going to be cheaper to use the nutrients that are already in the ground."

Manfred Kroger
PhD, professor of food science, Pennsylvania State University

Pam Marrone
business unit head, Novex Nordisk Entotech

Ellen Martin
science communications, DNA Plant Technology

Jim McCamant
editor, *AgBiotech Stock Letter*

An all-purpose superpreservative is a fantasy, according to our experts. Kroger doesn't believe there ever will be a solution to this "multifactorial problem that includes wilting, souring by bacteria, and many other processes." But experts like El-Begearmi and Marrone think biotechnology will eventually help in preventing spoilage, and Marrone mentions the possibility of transferring "a preservative gene from one organism into plants."

Our experts feel that an increase in aquaculture, the breeding of fish in undersea cages or huge land-based tanks, is unavoidable. "The exhaustion of the wild fish population will force ownership as the only way to control supply," Martin says. El-Begearmi agrees, pointing to the recent declines in cod, haddock, and salmon ocean harvests. And he speculates that an FDA regulation protecting consumers from harmful bacteria in seafood may help quicken the growth of aquaculture.

Kroger compares food tablets to baby formula and the liquid nutrients used to keep comatose patients alive. He claims, tongue-in-cheek, that he could patent such a product next year. More seriously, he agrees with our experts who think that while science might be ready for food tablets, our culture isn't. According to McCamant, although a tablet might be useful for emergencies, "We're headed the other way in this society, with people cooking, eating out, and enjoying food more."

The experts agree that the market for genetically engineered produce will increase as the public's fears are eased by first efforts like the "Flavr Savr" tomato. According to Martin, "Long shelf life will revolutionize produce economics, and good-tasting produce will win consumers." And McCamant thinks genetic techniques will allow crops to be engineered for "insect and herbicide resistance." But Kroger, looking back to traditional plant breeding for improved yield and heartiness, argues that most produce already is genetically engineered in some way.

[The competition]

PLAYER STATISTICS 1994 PLAYERS

Chicago Cubs

Player	Pos	Age	Height	Weight	Bats	Throws	Games	AB	R	H	2B	3B	HR	RBI	BB	SO	CS	SB	CS%	AVG	OBP	SLG	OPS
Andruw Free	OF	26	6'0"	180	R	R	152	534	45	125	22	1	10	40	20	100	0	0	0	.234	.300	.400	.700
Jeffrey Leonard	OF	26	6'0"	180	R	R	152	534	45	125	22	1	10	40	20	100	0	0	0	.234	.300	.400	.700
Greg Maddux	P	30	6'0"	180	R	R	32	125	10	25	5	0	0	10	10	50	0	0	0	.200	.250	.250	.500
Tim Lincecum	P	25	6'0"	180	R	R	32	125	10	25	5	0	0	10	10	50	0	0	0	.200	.250	.250	.500
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Greg Maddux	P	30	6'0"	180	R	R	32	125	10	25	5	0	0	10	10	50	0	0	0	.200	.250	.250	.500

WE HAVE STATS.

PLAYER	RA	HR	RBI	SB	BB	SO	CS	PO	DP	TE	ST	LF	CF	RF	SS	2B	1B	C
BLOMQUIST	100	14	58	17	0	139	1	139	1	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (L)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONG (R)	200	15	15	0	0	0	0	0	0	0	0	0	0	0	0			

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ORGAN TRANSPLANTS

Despite the development of drugs that nearly always prevent the rejection of organ transplants, growth in the number of transplants has been slow. As of October 1994, the number of US patients waiting for donations is 36,000; the number of available donors is 4,000.

CELLULAR PHONES WORLDWIDE

Cellular phones have reached the masses, thanks to steady price cuts. While the US has the most cellular-phone users, Japan and Western Europe are experiencing rapid growth. Experts estimate that by the year 2000 there will be more than 80 million cellular phones in use across the globe.

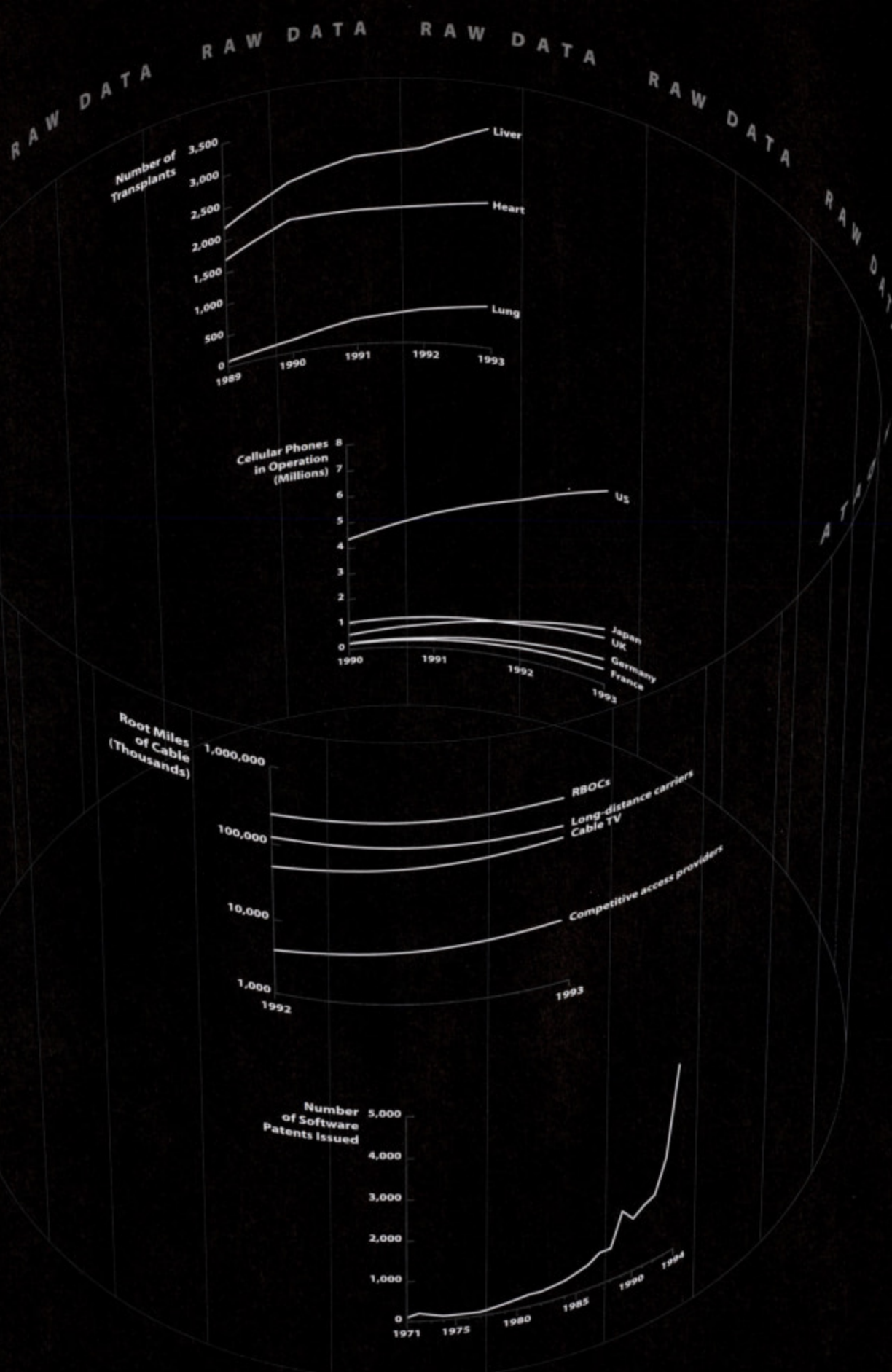
FIBER-OPTIC CABLE

Most of the fiber-optic cable in the US has been laid by the regional Bell operating companies. But the greatest growth is coming from the competitive access providers (who vie with RBOCs to provide telephone services to urban businesses) and the cable TV companies.

GROWTH OF US SOFTWARE PATENTS

The number of software patents has exploded with the progressive loosening of US patent restrictions. Programmers now face the daunting task of determining whether they are in violation of any of the 14,000 software patents in existence.

— Steve G. Steinberg



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All Aboard: the rush toward ATM

The universal language of the Net
will be spoken 53 bytes at a time.

By Steve G. Steinberg

Just as physicists dream of a final, all-encompassing theory, so technologists dream of a universal network, equally capable of handling voice, video, and data.

This dream began its march toward reality with the development of ATM (Asynchronous Transfer Mode) by researchers at Bellcore and Cambridge University. By combining the best of earlier voice and data protocols, ATM offered telephone companies a way to support both types of traffic over the same network. The companies' quick acceptance of ATM spurred interest within the computer industry.

A single standard for both voice and data promised an end to the networking Tower of Babel. The technology continues to evolve, and questions still

remain, but products that support ATM are now entering the market.

The buzz about ATM can seem unfathomable given how little the protocol really defines. The technique simply divides all information, whether voice or video, into very short snippets. These snippets, called cells, are 53 bytes long. The first five bytes contain header information and the next 48 contain the actual data. The content of the data bytes could be ASCII characters or the sound of a whistle, but ATM uses constant length cells. This ensures that delays are predictable and fair: small voice packets can't get trapped behind long data packets. Constant length also allows for

simpler – and therefore faster – switching hardware. While ATM doesn't specify a transmission speed, it was designed with the goal of gigabits per second in mind. The cell length of 48 bytes, however, was chosen purely out of the need to compromise: it was the arithmetic average of two competing proposals and left both sides equally unhappy.

Once information has been chopped into uniform cells, it becomes very easy to play with. Think of a data transmission as a train carrying ATM cells, making a transmission of 40 Mbits/sec equivalent to a train 100,000 cells long that launches every second. These cell trains depart from your phone or computer and are then routed through the network to their destination. Routing is done by ATM switches, which act like a switching yard: trains arrive, cells are switched to the correct output line (based on the address in the cell's header), and the newly formed trains are sent out. In the telephone network, the input lines may be copper while the outputs are fiber-optic cable, so an output train may be the combination of many inputs.

It is ATM's method of combining inputs, called statistical multiplexing, that makes the protocol so advantageous. A conventional telephone switch combines two 40 Mbyte/second cell-trains into one 80 Mbyte/second train by reserving the odd cars for the first input and the even cars for the second. This makes demultiplexing at the other end a simple matter. But it also means that if one input line is momentarily quiet, as is common with data traffic, half the output cars must go empty. ATM avoids this wasted bandwidth by allowing inputs to be mixed together in any order: demultiplexing is done according to the information in the cell's

header rather than the order of the cells. So by assuming that at least one line will be quiet at any given moment, ATM can multiplex, say, three 40 Mbyte/second lines into just one 100 Mbyte/second output. It does this by loading the train with all the cells that happen to be waiting. Of course, if all three lines start transmitting at full speed, a huge backup will occur as cells wait for an empty output car. Shaping traffic so that such simultaneous bursts don't occur – and figuring out how to cope when they do – are currently the hottest topics in the field of network research.

For statistical multiplexing to work, every ATM cell carries an identifier that defines its destination. Rather than assigning unique addresses to all destinations, as the postal system and Internet do, ATM has the source and destination agree on a randomly chosen number that uniquely identifies the connection only for as long as it is in use. This allows for shorter addresses, but also means that cells cannot be delivered until the identifiers necessary for a connection have been determined. For example, if I place a call from San Francisco to New York, my local switch might first send a request to the Chicago switch. These two switches will agree on some identifier, say 23, which neither switch is currently using. Chicago then repeats this process with the switch in New York and the two agree on an identifier of 42. My voice can now be chopped into cells identified by 23 and sent. When these cells arrive in Chicago, the switch looks up 23 in its table and sees that the next hop is to New York and that the hop identifier is 42. So the addresses in all my cells are changed to 42 and then shipped off to New York. Of course, the reality is somewhat more com-

plex: ATM uses two numbers for an identifier, one number is more general than the other, and some switches may look at only the more general.

As ATM defines only the format and addressing of a cell, additional protocols are required for real applications. Below ATM is a lower-level protocol such as SONET (Synchronous Optical Network), which defines how bits are transmitted over fiber-optic lines. This layer also defines the speed of the ATM network, with the most popular standard, SONET OC-3, running at 155 Mbytes/second – about 15 times faster than current computer networks. Above ATM is one of the ATM Adaptation Layers that defines how cells are re-assembled into larger units (such as data packets or video frames) at their final destination. And above the adaptation layer, there will probably be a protocol such as TCP to provide error-handling, since ATM is not able to guarantee error-free delivery.

Despite ATM's flexibility, or perhaps because of it, ATM will not be a panacea. Due to the small cell size, it will probably be too inefficient for high-speed LANs, despite all the hype you hear at shows like NetWorld + Interop. Nor is it clear that ATM is suitable for traffic dominated by constant bit-rate streams. But there is no doubt that ATM will be extremely important. It will be a universal language in the same way that English is, filled with compromises and borrowed concepts from other languages, awkward in certain situations, unusable in others. Yet, logical or not, through sheer popularity, it will alter how we communicate.

Steve G. Steinberg (steve@wired.com) never wants to be a member of a standards committee.

"Don't mistake a clear vision of the future with a short distance." — Paul Saffo



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The Letter U and the Numeral 2

What happens when your art consists of sampling other people's work?
If your name is Negativland, you get your ass sued by U2.

So you settle.

And then strike back, with an even more subversive challenge
to the copyright cabal.



This story juxtaposes things that should never be within a million miles of each other. It's a story of little guys fighting big guys, of the volatile mixing of art and

business, of indie-label musicians and corporate lawyers. It's not a funny story, although the term *pro bono* might make you laugh later. It's a story that hasn't ended yet, but by the time it does, lots of money will have changed hands, and lots of people – musicians, pop stars, record companies, and

lawyers – will have spent thousands of hours in court.

The story is about Negativland, a collective of three or more friends who sometimes get together to make music. Well, maybe it's music: recorded audio material – television jingles, radio talk-show clips, conversations culled from radio waves, anything that features the sound of a human voice – is fodder for the collage that comprises a Negativland recording. Mediaddicts who see society suffering under a constant barrage of TV, canned imagery, advertising, and corporate culture, Negativland's members are, by self-definition, artists of appropriation. They create with mirrors.

Gathering the most memorable, most evocative, or most provocative chunks from the spew, they reassemble them into something new – occasionally political, frequently critical – and spin them back into the barrage. Combining, say, car-manufacturers' slogans, sound effects, and a PSA warning against drinking and driving in "We Are Driven" (from their 1993 release, *Free*), they create a danceable phantasmagoria that disses our cul-

By Colin Berry

ture's obsession with the automobile: simple enough, thought-provoking, and pretty funny. At their worst, the members of Negativland are repetitive and smarmy; at their best, they are razor-sharp, microscopically focused, and deadly accurate.

At a tiny North Oakland, California, studio, where he collaborates with Mark Hosler and Don Joyce (Negativland's brain trust), Chris Grigg explains the band's techniques. "By working with several levels at the same time, we encourage people to observe multiple meanings – even if they aren't intended – in everything around them," he says. Negativland invites us to inspect more closely the surrounding world and its media, a practice Grigg calls "instructive, terribly fun, and a bit psychotic."

Using closer inspection as a working philosophy, Negativland creates plenty of media itself: CDs, LPs, EPs, cassettes, a video, magazines. *Time Zones Exchange Project*, a double CD with a 28-page booklet, released last October, is an elaborate, Church of the SubGenius-meets-Griffin & Sabine historical hoax. Some members of the band produce KPFA-FM's *Over the Edge*, a weekly 5-hour improvisational radio program in nearby Berkeley. Others are finishing a "caustic, perversely complete" guide to Disneyland. The band's latest project, a CD and book entitled *Fair Use: The Story of the Letter U and the Numeral 2* is inspired by a recent adventure they had with the law. You might have heard about it.

Three years ago, in August 1991, the band and its label at the time, SST Records, released a single called *U2* that featured a U-2 spy plane, the lettering "U2," and Negativland's name in small print on its cover. The recording included about 35 seconds of a U2 song, *American Top 40* icon Casey Kasem making disparaging comments about the band ("These guys are from England and who gives a shit?") while bawling out his staff, CB-radio conversation, and inane commentary from The Weatherman, one of the group's occasional members. Innocuous and very funny, *U2* was signature Negativland. Despite its cover, it could never, once heard, be mistaken for a recording by the Irish pop zillionaires, it would never be taken for anything other than a parody, and it would be unlikely – since Negativland had never sold more than 15,000 copies of any release – to reach a huge audience. *U2* wasn't going to make anybody rich, nor was it going to make Island Records Ltd., U2's label, poor.



Mediaddicts who see society suffering under a constant barrage of canned imagery, Negativland's members are artists of appropriation.

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**"There's only 'pay for everything you use' or parody.
But surrealism? Unknown.**

Collage? Never heard of it."

But it nearly bankrupted Negativland.
"The bulk of appropriated material on our earlier releases was from fairly obscure stuff," says Joyce in retrospect, "and U2 marked the first time we had ever taken on pop music. It wasn't even something that attracted us, but it just became appropriate because we got these Casey Kasem tapes mentioning U2. It's nothing we'd have chosen to do otherwise."

Within two weeks, Island filed a suit attacking U2 on two counts, claiming that the song's cover art violated trademark protection and that its music's "unauthorized use of a sound recording" violated copyright law. Island demanded that every copy of the single and all materials for its promotion and manufacture be immediately delivered to the company for destruction and that U2's copyright be reassigned to Island. In less than a month, Negativland and SST Records stood to lose an estimated US\$70,000—more than Negativland had made in 11 years as a band. The group counted on fair use's wrinkle to justify U2.

But faced with massive potential expenses and growing pressure from both Island and SST, the band agreed to settle out of court. "It felt to me like my child had been kidnapped," remembers Hosler, who, with other members, suddenly faced terms of an injunction he couldn't afford to fight. SST, which stood to lose even more, pressured them to accept the settlement.

Two grim realizations dawned on the band members: The first was that the law, as interpreted, did not legitimize their aural collage as art. The second was that business interests within the music industry, relying on the economic expense of legal battles, had the capability to squelch small artists who sought to challenge the legal status quo. From the start, Island's argument had been one of economics: Negativland was attempting to profit from U2's popularity, and the group had timed its decoy release to coincide with an upcoming U2 release (previously *Joshua Tree* had sold more than 6 million copies in the US). And Negativland couldn't afford to prove themselves innocent.

"It wasn't a policy at Island records but a

de facto understanding throughout the record industry," Grigg clarified. "There's a certain way things are supposed to be done.

If you don't play by the rules, they come down on you. If SST had paid the compulsory license fees for the song, this probably wouldn't have happened."

"But art has always had the job of using the best means available to make statements about individual life," he continues. "It's extremely effective to actually apply our hands to this media barrage, cut it up, and turn it into something else that comments on it. That's one of the best ways to make art that we can see right now. But that's the central problem: the laws don't realize the legitimacy of this."

According to Negativland, current statutes don't take into account any of a number of artistic forms and techniques, some of which may "actually conflict with what others claim to be their economic domain." Appropriated art is commonplace in other milieus—Rauschenberg and Warhol made great use of it in the fine arts, and borrowed melodies are common in folk music—but it has yet to be acknowledged in contemporary musical forms. "If you read the copyright laws," Joyce says, his frustration showing, "there's only 'pay for everything you use' or parody. But surrealism? Unknown. Collage? Never heard of it. It's as if collage never happened."

Jeff Selman, an attorney who, through California Lawyers for the Arts, began to assist Negativland after the settlement, says it another way: "Whether or not someone would look at a visual or musical collage and say 'Yes, that's an allowable fair use' hasn't been tested. It's a fine-line distinction between what's pirating and what's fair use. But everybody may be trying to draw fine lines where they can't be drawn." He points back to the central argument in the whole case: "It comes down to an issue of money."


That's where Negativland wants to make changes. Copyright laws, according to the group, should protect artists from bootlegging, provide compensation for cover versions—and nothing else. Art, they are fond of reminding us, is not a business. While overturning current copyright laws would

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**The idea behind copyright is that
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for what they've done,
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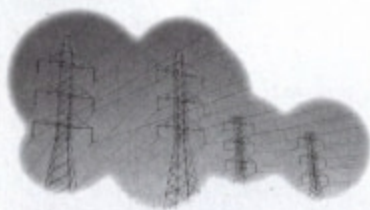
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"Music for the Masses"

mean major artists (and their agents, publicists, and staff attorneys) would make less money, the culture as a whole would benefit from the freedom of other artists' subsequent access to raw materials with which to sculpt new art. A small sacrifice, they argue, for society at large.

Though it finally acquiesced on Island's cover-art claims, Negativland has never, since the injunction, weakened its stance on revising copyright law. Relentlessly seeking publicity for the case, the band chronicled its adventures in a 96-page magazine that included press releases, faxes, letters, an interview it conducted for *Mondo 2000* with U2 guitarist The Edge, and litigious threats from Kasem and now-estranged SST. It released a 25-minute CD "lecture" that spells out its position in tongue-in-cheek academic clarity. Grigg has written an article for *Keyboard* (June 1994) that traces recent copyright cases and investigates the US Supreme Court's current rulings on fair use. Live, the band performs an agitpop set advocating interpretations of needed changes within copyright law. And the suit has fueled the January release of *Fair Use: The Story of the Letter U and the Numeral 2*.

Besides a lengthy appendix compiled for artists wishing to examine fair use provisions, the 275-page *Fair Use* will also include a 45-minute music collage addressing the subject, using appropriated material that exemplifies the very techniques Negativland advocates - coupled with 25 minutes of *faux* lecture from their previous recording.

"It's an in-your-face dare," admits Joyce, "because a lot of famous things will be recognized right away as taken. In a way, it's much more dangerous than U2, because there must be 17 different huge corporations involved, any or all of whom could sue us."

"But this time," adds Grigg, "if they do, we can find free legal help to fight it and, if we know what we're doing, probably win. All of the lawyers who looked at U2 said later that if we had fought it, we could have set a precedent for fair use. That's the greatest tragedy: if we'd have known, we could have changed

things for everybody."

Advocating that art released in the public domain should be available for all artists - and free from copyright - jars our notions of just compensation, of American laws traditionally protective of property. It pits creators' compensation against the free flow of ideas.

"Some people are going to say, 'But these guys are ripping people off, they're taking stuff and using it when they ought to be paying for it,'" says Grigg. "Well, there's a problem there. Cultural properties are a special kind of property: a car is not the same as a song. The idea behind copyright is that people who create should receive adequate compensation for what they've done, not every possible compensation. Once you go that far, you start putting manacles on culture; it marks the end of public thinking."

Attorney Selman agrees: "Intellectual property is not the same as personal or real property," he says, adding, "and the whole purpose behind intellectual-property rights is to stimulate growth."

Incredibly, the story's not over, even as Island's icy grip on U2 appears to be thawing. Most recently, Island agreed that if Kasem agrees not to sue U2's label, Island will return the single to Negativland. "All we have is an agreement in principle," says Hosler, his enthusiasm tempered by the three years it took Island to get to this point, suggesting that rather than a change in policy, the label's latest move is one of self-interest.

Hosler is tired; he just finished the final mix on Negativland's new release. "If Casey Kasem is smart, he'll just ignore us," he sighs. "But maybe, after enough time" - and there's a glimmer in his voice - "they'll get the idea that we're never going to go away."

To order *Fair Use: The story of the Letter U and the Number 2*, book and CD, contact Negativmailorderland: +1 (201) 420 0238, fax +1 (201) 420 6494. ■ ■ ■

Colin Berry (cpberry@aol.com) lives in San Francisco. He is a writer and a DJ at KUSF-FM. He wants to quit his night job.

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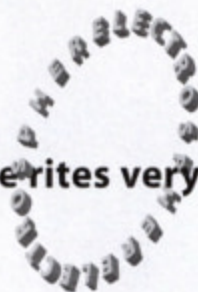
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This Test Is for You

Standardized testing is a communal rite of passage.

Computer-adaptive testing is about to make those rites very individual.



By Carol Cooper with Perry N. Halkitis

Ditch that Number 2 pencil. Erase those little bitty bubbles right out of your memory. Don't fret about picking only *one of three* days in the year for that tension-filled 7:50 a.m. drive to the testing center. Change is afoot. High-tech innovations in computer-adaptive testing, or CAT, are forcing educators to reconsider the way standardized tests are administered and evaluated.

Using mathematical formulas that have been part of statistical theory for decades, CAT programs make snap

judgments about how smart you are according to how you answer each question the programs decide to give you. Imagine this: you're sitting down to take one of any number of standardized tests, be it a well-known exam such as the SAT or the GRE, or a more specialized test you might take as a firefighter trying

to prove your mettle. CAT software presents an item of average or typical difficulty. Based on your response, the next item is either easier or harder. An incorrect response tells the program that the last item was too hard for you and that perhaps your true ability level is lower; a correct response means that your ability requires something more challenging.

Now, the question of whether any timed battery of multiple-choice questions can predict anything useful about human intelligence is still open. If you're the sort that believes all standardized testing is a con job—some sort of pseudo-scientific shuck to unfairly exclude certain people from the colleges and careers they'd like to enter—then the current movement to computerize these tests won't impress you. But both your job and the education your children receive are largely determined by performance on standardized tests, so you can't escape the spectre of this kind of testing. Nor can you escape the spectre of CAT.

So what, precisely, happens when you bid farewell to those bored proctors and toss your Number 2s? Once

approved to take an exam, individual applicants are mailed a toll-free telephone number to schedule a testing appointment at their convenience. Say you're an aspiring nurse. On the chosen day, you arrive at one of several local testing centers, are assigned to a private terminal, and take a nursing exam. Data you input is transferred via modem from the center to the central hub of the computer outfit and from there to the mainframe of the testing company overseeing the examination. To ensure accuracy, supervisory organizations then confirm results through a re-application of the test "key" before final verification of pass/fail status is sent electronically to the state nurses' licensing or certification board. Through CAT, all of this is possible in a few days; by contrast, traditional paper and pencil testing still requires a one- to two-month turnaround before giving you your results.

Besides the obvious convenience and the fact that electronic delivery, storage, and instant scoring of computerized tests should eventually render them cheaper to administer, computer-adapted tests have other subtler advantages. For instance, computing capabilities make it possible, in the jargon of teachers and testers, to "self-adapt" exams. In the winter of 1992, the *Journal of Educational Measurement* published a study comparing results from self-adaptive and computer-adaptive tests. Using MicroCAT, testers had developed an item bank of math problems comprising six levels of difficulty. In the self-adaptive version of the quiz, students were given the chance to select their own level of difficulty on each question, rather than being randomly judged based on the previous answer. This option resulted in higher overall scores for the students taking the self-adaptive version. Proponents argue that such flexibility allows CAT to get closer to measuring skills and intelligence, rather than some abstraction of them.

In many cases, it's almost impossible to measure ability without using performance-based and simulated assessments rather than the old standby, multiple choice. One example of a simulation exam is the Clinical Competency Test in Veterinary Medicine, developed by the Professional Examination Service. Here, aspiring vets are given various scenarios in which they have to work through what they would do in each hypothetical situation. Examinees choose from a list of procedures that produce appropriate consequences. Say the patient du jour is an ailing gerbil. The examinee is presented with symptoms that increase or decrease in severity according to what treatment is prescribed. Obviously, the objective would be



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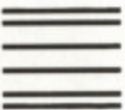
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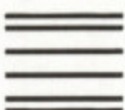
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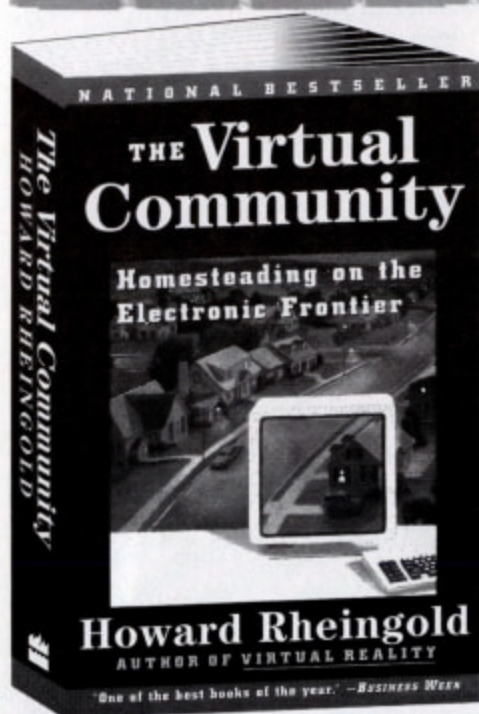


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speed up and streamline authentic assessments in ways that ultimately render unidimensional, multiple-choice models obsolete.

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used by rich, ivory-tower evaluation services within reach of average citizens. Free-market competition and entrepreneurial savvy can do the rest, eventually destroying the hegemony of over-simplified multiple-choice templates. Champions of testing reform, who've spent years telling people that sacred cows like the SAT are neither sacrosanct nor infallible, might now be taken more seriously.

But all the hype has not eliminated the raging controversy that has surrounded the testing world for years. The very seductiveness of all this added convenience obscures certain ethical drawbacks of using CAT to further popularize standardized testing, and it diverts attention from problems inherent in CAT itself. One debate now in high gear concerns biases in testing and the need for disclosure and evaluation of test questions.

A group making much noise in this discussion is FairTest, based in Cambridge, Massachusetts. The team works with educators, policy makers, parents, and teachers to advocate reform and public accountability in national testing protocol. FairTest's Public Education Director, Bob Schaeffer, is a sharp, affable, politicized zealot with a degree from MIT. Schaeffer is against "bad tests in pretty new packaging," tests that have been greatly improved simply through the addition of computer technology. To him, a toad in a golden cage is still a toad. "The first major use of mental measurement in this country was in World War I, when the Army Alpha Test was purportedly used to assign jobs to soldiers," Schaeffer explains ruefully. "Thousands of people were labeled morons or worse because they couldn't answer questions like: A puck is used in the following game: (a) tennis, (b) football, (c) hockey, or (d) golf. The questions were clearly only measuring how familiar a person was with American culture of that time, not how intelligent that person was." Schaeffer would rather the US not recreate the kind of policies for immigration and job placement that stemmed from the suspect findings of the Alpha Tests.

If Bob Schaeffer represents a more critical perspective on the motives and methods of standardized testing, John Katzman, president of The Princeton Review, one of the largest commercial test-coaching companies, takes a more pragmatic stand on the business both he and the test makers are in.

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that reflects the rapport he feels with the ambitious youngsters he helps by devising coaching materials. "Our interest focuses on the openness and the fairness of tests. It's not a theoretical exercise for us. It's, What do we do with *this*?! So when the CAT for the GRE first came out in the early '90s, we realized that this is the way the world is going, and we wrote our own software to check it out."

Katzman testified last year before the New York Senate Higher Education Committee, presenting his ideas on how CAT methodology could be changed to satisfy both the testing companies' need for cost-effective content security and FairTest's need to check item banks for faulty and biased questions.

"I don't think that CATs are a bad idea," Katzman is careful to point out. "There are

"average," and it's a big struggle to recover.

This is the quirk in CAT that bothers the coaching centers. After paying big bucks to figure the angles that allow their students to beat statistical odds, CAT methodology is making coaching centers' jobs a little tougher. Coaching centers teach you to answer questions on traditional standardized tests, but the game becomes significantly harder when computer-testing software branches out and adapts, testing each student differently with its database of thousands of questions.

Though riddled with ethical and other troubles, standardized tests remain a ritual practice throughout the Western world. The Academy and perhaps even society in general love to mystify and fetishize the testing

As children, we learn to fear and worship the instruments of mental measurement, and a good part of our self-esteem centers around how the kind, quality, and quantity of our knowledge is judged.

a lot of advantages. You can take them almost any time, you can get your score back immediately, those are all great things. The main problem is disclosure."

It's always been the position of Educational Testing Service, the US's largest maker of multiple-choice exams, that you can't use a test once you have disclosed it. So Katzman suggests that, particularly for the adaptive GREs and the inevitable SAT conversion, testing services amplify the available item bank to include all the thousands of previously disclosed and approved questions. If the computer is selecting items from a bank of 10,000 rather than from just 100 or so brand-new items, it should be impossible for kids to memorize and share answers to any appreciable extent.

Further problems with computer-adaptive tests derive from the structure of the programming. Whereas traditional tests used 200 equally weighted, multiple-choice items, the first few "adaptive" questions on these shorter interactive models are intrinsically worth more toward a final grade than items that appear further on. In short, getting the first three or four questions right on a CAT usually bumps you up to a range of difficulty that places you on the "smart" end of the scale, from which it's hard to fall too far, no matter what you do. Getting the first few key items wrong, however, may drop you from "smart" (in the computer's estimation) to

process. Ultimately, this may be the biggest obstacle to change how we view and measure human achievement. The hundred million standardized tests given in the US each year is a rite of passage. As children, we learn to fear and worship the instruments of mental measurement, and a good part of our self-esteem centers around how the kind, quality, and quantity of our knowledge is judged. Addicted to the competitive egoism which results from ranking others as better or worse off than ourselves, we've learned to indulge that somewhat ugly urge in the sainted name of science.

Still, despite its limitations, CAT proponents insist that adaptive testing isn't only a method for speedier test tabulation. The hope that CAT holds, its champions claim, is a future where the testing process our society seems so drawn to will more accurately assess the width and breadth of a student's knowledge. By allowing for differences, CAT more clearly reflects the reality of how - in a world of infinite facts - different people can have different knowledge sets and varying thinking structures, and still be accurately judged as competent. ■ ■ ■

Carol Cooper writes regularly on race, sex, and education for The Village Voice and New York Newsday. Perry N. Halkitis is director of statistics and computer services for the Professional Examination Service.

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The Latest Action Heroes

Street Fighter, Doom, and Myst are all headed for the silver screen.

Only problem: so far, nobody in Hollywood has figured out how to make a game into a movie

– and make it work.

By Scott Rosenberg

The US headquarters of Capcom, the videogame firm that makes the popular *Street Fighter* series of games, lies in a flat office-park corridor off US 101 in Sunnyvale, California, surrounded by the corporate hives of more venerable firms like Amdahl and Hewlett-Packard.

You might hold a technical conclave here; certainly a marketing meeting. But a Hollywood press conference and movie-launch party? Where'd we take the wrong turn?

Capcom has spent US\$40 million to make a movie based on *Street Fighter*, and it's determined to get its money's worth of show-biz glory. So on this Thursday, late in



Capcom has spent US\$40 million to make a movie based on *Street Fighter*, and it's determined to get its money's worth of show-biz glory.

September, it has gathered executives and actors and journalists – and even a couple of kids – to fete the film.

Waiters in martial-arts robes serve sushi while the *Super Street Fighter II Turbo* arcade machines lining the walls flash their messages of challenge: *Attack me if you dare. I will crush you.* Watch them long enough and they'll also inform you that *Winners don't do drugs.* A boy in baggy pants – maybe 10 or 11 years old – makes a beeline for the games. The adults stare from a respectful distance.

Jean-Claude Van Damme, who plays *Street Fighter*'s hero, Colonel Guile, is in Pittsburgh, shooting another movie, and sends his videotaped regrets. And the press conference's big draw, fleet-footed San Francisco 49ers star Deion Sanders, who has recorded a rap number for the film's soundtrack with his chum Hammer, is a no-show: he twisted his ankle during practice the day before.

In the new world of interchangeable, interdependent entertainment modules – *athlete performs four songs on soundtrack to movie based on videogame!* – a football

injury can have unexpected repercussions.

I'm here looking for some insight into the growing practice of adapting games into movies. There are plenty of them – *Double Dragon*, from Gramercy Pictures, in fall '94; *Street Fighter*, which Universal was to put in 2,000 theaters this Christmas; *Mortal Kombat*, from New Line, in spring '95. Beyond these loom movies based on *Doom*, the shareware phenom, and *Myst*, the fantasy-realm CD-ROM hit.

So far, though, insights are not exactly jumping out at me. Capcom's Director of Licensing, Jun Aida, mentions that the company has adapted digitized images of the movie's cast for use in the next arcade version of *Street Fighter*. It's the old marketing dream of synergy, turned into a closed loop of name-recognition feedback.

You've played the game; now see the movie.

And then: *You've seen the movie; now play the movie character in the game!*

There's only one problem: the sole representative of the target market here doesn't sound like he's buying it. "You mentioned changing Colonel Guile around so he'll look like Van Damme," asks the young game player when the press conference turns to Q&A. There's a suspicious note in his voice. "What did you mean by that?"

In the game, Colonel Guile is a muscle-bound cartoon, a punked-out, surf-dude GI Joe with a canary-yellow flattop you could land a helicopter on. In the movie, Guile is Van Damme.

So, the \$40 million question is, Will the junior *Street Fighters* who made Capcom's game a hit knuckle under to such changes? Or will they accept no substitutions?

Movies about games have almost always been flops: *The Wizard* (1989), *The Last Starfighter* (1984), even the ambitious-for-its-time but deadly dull *Tron* (1982).

In Hollywood's long-term memory, the history of videogame adaptations begins way back in the summer of 1993, when Disney's \$46 million movie based on Nintendo's *Super Mario Brothers* games met a sudden, spectacular death at the box office.

Maybe that happened because in the time it took to get the movie made, Sonic the Hedgehog had become more popular than Mario. More likely, it was just that the film was awful. Either way, for a time the conventional wisdom in Hollywood became: you can't make a movie based on a videogame.

But that couldn't last – not given the level of entertain-

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ment-industry hype for all things interactive, and not given the sheer economic clout of a videogame business with larger grosses than the movie business. In 1994, game deals suddenly became trendy in Hollywood. Where once the traffic between the film and game industries was strictly one-way – “We’ll make the movies,” the studios would say, “and then you can pay us to license the game rights” – now it moves in both directions.

For example, Id Software, maker of *Doom*, has a movie deal with producer Ivan Reitman. There’s no production schedule yet, but Id’s Jay Wilbur says the company hopes a film will help the game “break out and become more of a household word.” What if the movie fails? “We’ve done what we set out to do with the game,” Wilbur answers. “The rest is extra pudding.”

A “feeding frenzy” earlier this year to close a movie deal for *Myst* made the game’s creators, brothers Rand and Robyn Miller of Cyan, call a time out. “It got a little out of hand,” says Rand Miller. “We were selling things that people hadn’t even seen yet, and we were worried about keeping control of the quality. We don’t want this to just get thrown

together because *Myst* is hot.” The Millers’s plan now is to produce a trilogy of *Myst* books first – they’ve got a \$1 million book deal with Hyperion.

“Translating a videogame into a movie is like translating an Ethan Allen furniture catalog into a movie,” says Michael Backes, screenwriter and co-founder of Rocket Science Games.

All too frequently in Hollywood, the Miller brothers faced generalizing questions about plot. “That was a little depressing to us,” Rand says, “because we know exactly what the movie is, what the back-story is. So we wanted to step back and say, ‘Let us get the book done and then when you read it, you’ll see what you can make a movie from.’”

In any case, long before either *Doom* or *Myst* hits the screens, the success or failure of the wave of game adaptations preceding them will determine whether the game-to-movie concept remains hot in Hollywood.

The fighting games leading this wave are a breed apart from the games I was addicted to 15 years ago – *Asteroids* and *Space Invaders*. After all, nobody was going to try to build a movie around a stick-figure spaceship or a horde of bleeping blobs. But *Street Fighter* and *Mortal Kombat*, arcade sensations that became bestselling home cartridges as well, are a different story. They’ve got rudimentary casts of fighters with differing abilities and traits – there’s even an occasional female character, like *Street Fighter*’s Chun Li, with her deadly “whirlwind kick” (stand on head, spread legs 180 degrees, point toes, and spin like a top). It’s not that much of a stretch to imagine the world of high-end fighting games bleeding into the realm of low-end action movies – one pop continuum.

There’s a hitch, though. So far, nobody in Hollywood has figured out how to make a game into a movie and how to make it work: to recreate that adrenaline-forged link



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between a twitching finger and an active screen. At the same time, the games don't provide filmmakers with many of the elements that make movies work – like gripping narratives and absorbing characters.

"Translating a videogame into a movie is like translating an Ethan Allen furniture catalog into a movie," says Michael Backes, screenwriter and co-founder of Rocket Science Games. "Videogames are often very much about environments and not so much about character interaction. So it's difficult to come up with a believable, dramatic, and emotional conflict. I think they're going to find that it's a more difficult area to mine than they think. There'll be some exceptions, but most of this stuff will be crap."

Game players will surely forgive cheesy stories and crude characterizations because they get something that movies don't offer – involvement and feedback. But why would anyone want to watch a big movie image of Mario or one of the Street Fighters without a button to press?

Everyone has an answer, or at least a theory.

The Theory of Properties: In Hollywood, the standard answer is to declare that there is no question. A videogame, the argument goes, should be treated as a property, just like any other.

"It's an adaptation," says Steven de Souza, the writer-director of *Street Fighter*. "You look at the original material, which is going to be a novel or a comic book, or a Broadway show, or a straight play. And you ask, What works as a movie and what doesn't? What translates into this particular medium and what doesn't?"

With *Street Fighter*, de Souza says, what translated were the characters, some of their costumes and some of the game's "sets," or backgrounds.

"The only way the movie could disappoint a kid is if the kid were to say, 'I really wanted to see character A fight character B, and that didn't happen.' But there are 16 characters, and they can't all fight each other. So I'm already in trouble. But they can go see that in the arcade. What I can give them is all the things that happen when the characters aren't beating each other into submission – relationships and fun and romance and danger. You know, movie stuff. The characters all have external lives. Everybody has a day job."

Larry Kasanoff, the producer who's making the *Mortal Kombat* film for New Line, takes a similar tact. "This videogame is popular because it's got great characters and great

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playability – and, frankly, some really cool violent finishing moves that are kind of fun.” (The viscera-ripping, blood-spattering finishing moves are what turned *Mortal Kombat* into Exhibit A of the videogame violence debate.) “What can I translate into a movie? With great stories and great characters, I can do better. I have a better idea for the finishing moves, too – you’re going to learn what really happens, with state-of-the-art special effects. Playability I can’t do at all, and I don’t want to. It’s not that kind of medium.”

The Next Level Theory: If movie studios see games as just one more medium to ransack for “pre-sold” properties, game companies see movies as just one more way of differentiating their products in an increasingly crowded marketplace.

“We’re taking our property to the next level,” explains Capcom’s Aida, the licensing

Maybe you do want to be the *Street Fighter* guys – I don’t know their names, Kung Wo, whatever – but I think they’re more like your tennis racquet. When I play against you, I play me using the Kung Wo racquet.

“Now, when they do the next *Street Fighter* game after the movie, and the characters are exactly the same guys, if I can play the game cleverly and resolve the movie differently, that’s a cool thing. Obviously somebody’s going to win this big street fight in the movie. And it’s probably going to be Jean-Claude – what a surprise! But if, depending on how good the players are, a different guy wins, that’s cool. But that’s not going to happen on the big screen, it’ll happen on the little local screen, the game screen.”

How would Fulop want to see one of his games adapted for the movies? “I frankly have no idea. Because we have no characters

Hollywood hasn’t figured out how to make games into movies without losing what makes games work – the adrenaline-forged link between a twitching finger and an active screen.

executive behind the *Street Fighter* movie project. “When you play the game, you cannot relate to a character as anything other than a computer-graphic warrior. When you watch Jean-Claude as Guile, West Studi as Sagat, or Raul Julia as Bison, you walk out of the theater with a completely different feeling. After experiencing the live-action movie, our *Street Fighter* players will go back and play with a different feel. Guile will be someone they know.”

But is that what players want from a game? Does it “enhance game play” to know where your character works during the day?

The Tennis Racquet Theory: A relatively disinterested view from a game-business veteran, comes from Rob Fulop of PF Magic, which makes the 3-D fighting game *Ballz* (no movie deal).

“Stories and games depend on completely different processing centers,” says Fulop. “When you play a game 10,000 times, the graphics become invisible. It’s all impulses. It’s not the part of your brain that processes plot, character, story.

“If you watch a movie, you become the hero – Gilgamesh, Indiana Jones, James Bond, whomever. The kid says, I want to be that. In a game, Mario isn’t a hero. I don’t want to be him; he’s me. Mario is a cursor.

– our characters are so shallow. And we have no plot. So what goes? The theme. And the name.”

The Serial Encounter Theory: This scholarly view is proffered by Marsha Kinder, a professor of critical studies at the University of Southern California. In her pop-culture analysis *Playing with Power*, published in 1991 Kinder wrote: “Children of my generation were usually introduced to the moving image when our parents first took us to the cinema; thus moviegoing tended to remain for us a rich source of fantasy. But to kids who are raised on television, moviegoing frequently translates into a frightening loss of power. In contrast to television, the oversized movie images and overbearing sounds demand their undivided attention for long stretches of time and deprive them, not only of control over what they perceive, but also of periodic retreat into a comforting domestic background.”

What does Kinder think about the new game-based movies?

“The real problem with something like *Mortal Kombat* is that its genre is one-on-one serial combat. It’ll be very interesting to see what kind of narrative they put forth. It’s not as if there aren’t any precedents for one-on-one serial encounters in movies, but they

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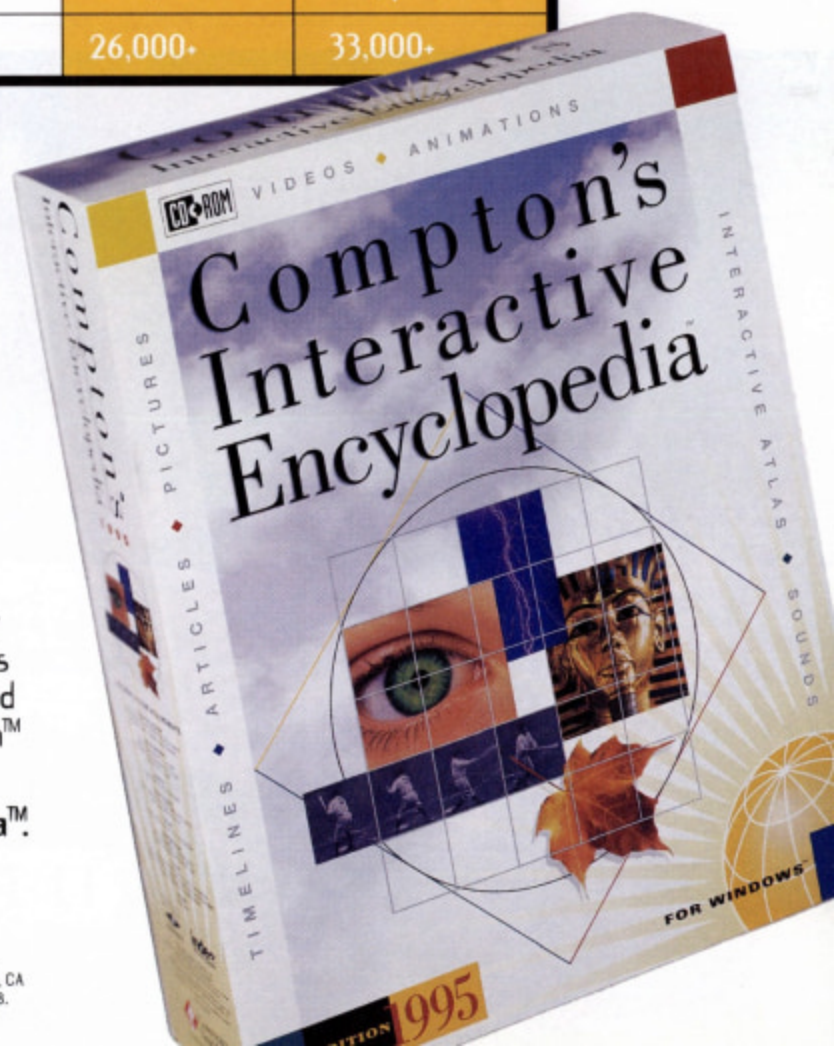
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haven't been fighting movies – they've been psychological dramas like Ingmar Bergman films. And, of course, pornography.”

For that reason, Flint Dille – screenwriter (*An American Tail: Fievel Goes West*), game designer, and self-labeled “multimedia guerilla” – suggests that *Street Fighter* and *Mortal Kombat* would make a better TV series than a movie: “Every episode, a different guy could win. That could sustain something like this, keep it alive.”

The Theory of Respect: Dille reminds me that creative attitude counts for a lot.

“The closest metaphor for this is turning comic books into movies. And where that goes awry, nine times out of ten, is that the people assigned to do it have no respect for the material, or have a condescending attitude toward it. I don't think the *Super Mario* movie was made by anyone who had sat down and gotten a great deal of joy playing that game. They just wouldn't have made that movie.”

It's time, clearly, to talk to some people who really respect their games.

On a warm Sunday afternoon, I visit the

Namco Cyberstation arcade at San Francisco's Pier 39. Outside, a mariachi band's trumpets warble, and tourists down chowder, pretzels, popcorn. Inside, children line up for

So here's the \$40 million question: Will the junior Street Fighters who made Capcom's videogame a hit now go for the movie?

the bumper-car ride, while the videogame screens cycle through their come-ons. The din is deafening.

Over at the *Mortal Kombat* console, the game is demanding: *Finish him*. An older kid shows a younger boy how.

I ask them if they know there's a *Mortal Kombat* movie on its way.

“Unh-unh.”

Would they want to see it?

“Dunno.” “Maybe.” “Wanna play?”

Clearly, this is not going to be an in-depth interview. I accept the older one's challenge

and put a couple of tokens in the machine.

Thwack! Thud!

Finish him.

Before I can even figure out the controls, I'm dog meat.

Whatever the commercial logic of adapting games into movies, perhaps there's a deeper psychic logic. Whether you view these games as engines of kid empowerment or just think they're brain-numbing exercises in video violence, you can't escape the fact that kids are really good at them. Your average 10-year-old can whip your average adult's butt. When you translate the game into the familiar idiom of an action movie, you return it to a medium that's entirely adult-produced, adult-defined and adult-run.

Turning games into movies is certainly about selling stuff to kids; there's no denying that. But maybe – on some level that no one in the business is likely to examine – it's also about making grown-ups feel safer in a world they can't control. ■ ■ ■

San Francisco Examiner movie critic Scott Rosenberg (scottros@well.sf.ca.us) writes frequently on digital culture.

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Online, no one knows you're a dog. Or a male.
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By Dorion Sagan

When my Yugoslavian friend chastised me, a writer, for not indulging in online affairs, I told him I didn't need e-mail; I already had enough junk mail. I really couldn't bother installing a modem simply to type inane messages to total strangers. Nonetheless, my mother had gone away to Europe, leaving her house mostly empty. She had a home office with a computer, where I could enjoy a sense of privacy should the need arise.

My brother had recently shown me how to track a stock portfolio, so I figured I could mouse around to

check out 15-minute delayed stock prices.

I logged onto America Online one morning on my mother's account. Her name is Lynn, one of those names that, while androgynous, is assumed to be female. As a certified computer ignoramus, I didn't think to change my displayed name, so I stayed Lynn. I navigated into

some all-American place called "Best Lil Chat House."

In real life, those of us over 30 are expected to be mature adults, ruled by society and superego. But here, it suddenly occurred to me, I could get away with being my most outrageous self. How far could I go? Pseudonymous and faceless, it seemed I could proclaim in the Best Lil Chat House whatever I desired. The potential for personality pranks and word games appealed to me. (Although self-given, "fictional" names are the rule rather than the exception online, the electronic aliases in this article have been changed to protect – and encourage – the guilty to continue with their delightful indiscretions.)

The talk in Best Lil Chat House was for the most part prosaic. But the use of punctuation symbols like brackets that sometimes surrounded names such as {{{{{{Beavis}}}}} piqued my curiosity. These were signs of affection similar to hugs. Amid much talk of coffee, some people offered a multiplicity of @ symbols in lieu of muffins.

My first few comments met with no explicit recognition by others in the room. Everyone was busy hugging each

other with brackets, kaffee klatsching, and praising the onset of spring. I was being ignored.

To stir up the situation, I announced I would have to poop soon. Still no reply. "Is anyone masturbating right now?" I wondered aloud. This remark did bring me attention. The comment earned the first reference to me by name (or rather by my mother's chosen login name, Lynn-marg). I felt an infantile joy. Suddenly, I was receiving the attention I craved. It may have been negative, but, hey, they were talking to me. They were saying I was vulgar. Veiled threats were made about being kicked off the Net. Someone mentioned an obscure bylaw prohibiting such verbal misdeeds as those I'd just committed. Mention was made of a personage known as a Guide – kind of electronic den mother providing a modicum of authority and technological direction.

But I quickly discovered that prudery was not universal. I attempted to enter a cyber-room called The Flirt's Nook. The room, however, was already at its maximum with 23 Don Juans and Mata Haris inside. I took up the computer's offer to send me to another room like the first. Here I was assailed by rabidly horny, faceless American males. I had momentarily forgotten that I was generally assumed to be a woman.

Not since I was, as a 7-year-old boy, mistakenly placed in the girls' group in day camp had I been so mortified by a genuine lack of appreciation for my gender. These male personae took little notice of the salient fact that I, too, was trying to charm females.

Even more remarkable, they paid no attention to my explicit claims to be male! "I'M A GUY," I would protest. "QUIT SHOUTING, Lynn-marg," came one reply – a reference to my use of capitals. "This is not my computer," I insisted. "I'm a guy. My real name is Dorion."

"What kind of name is that supposed to be?" typed someone, apparently enjoying my temporary emotional distress. This offhand comment sparked a Zen-like conversion. The experience of the mystic is to die – to let go of his ego – before he dies. He or she enjoys a death-in-life: it allows him or her to identify with others, to become them and ultimately one with the universe. In my epiphany, I accepted my fate. I would be unable to prove the gender of my identity while online. Let them think I was not a guy.

At first I merely tolerated the presumption that I was female. Then I actively coveted it. Women – it sure seemed like women – were friendlier. I would log on, in a token attempt to read the notices of stock-market advisers ("any bulls still out there?") or read an article from *Time*



I was so concerned about her sex, I had forgotten I was lying about mine. As things grew hot and heavy, I could not go back. It would break the romantic mood – the trust.

magazine, reprinted electronically on the service. But it was a charade. In less than two minutes from logging on (like a junkie warming a spoon, I loved the little series of baud-connecting modulation noises coming in through the modem), I would be entering the Lobby – the assigned port of entry into the hive of rooms – and from thence into rooms like The Flirt's Nook 2 and Romance Connection. I was getting hooked.

No one else was crazy about my newfound devotion to AOL: not my 9-year-old son, and especially not my girlfriend. And when my mother eventually returned from Europe, she took one look at the bill and shut down the service. But by then I had already succeeded in astronomically running up her bill.

Yet I never logged on as anyone other than my poor innocent mother. I had tapped into my verbal and dextrous celerity and channeled my meanness, lust, and anger in directions other than toward my poor, beleaguered girlfriend. As in some Hindu cosmogony where the world is illusory, I hid, Wizard of Oz-like, behind my computer, practicing random kindness and senseless acts of verbal beauty – when I wasn't taking a potshot at some total stranger for something as innocuous as continuing to discuss collegiate football. I could not wait to return to the computer. I could not get enough electronic attention. I was afraid to walk down the hall to the toilet lest I miss something.

By now I was being IM'd (instant messaged) by a tireless horde of hot-blooded all-American testosterone-crazed males. Although rooms such as Romance Connection or The Flirt's Nook 2 are public – everybody can see what everybody writes – it is also possible, as they say, to go private. This can be accomplished by an instant message. Whereas rooms are the typographical equivalent of party lines or living-room gatherings, IMs are like private booths. They pop up in a window above the conversation of the main screen. I was reading an instant message – something about “panties” – when I became aware of my girlfriend reading over my shoulder. She was not amused.

At first I pretended to be female only for enlightenment, or so I told myself. Back in the Best Lil Chat House, but now at night and with a more boisterous and tolerant crowd, I hung out with people I was quick to consider my soul mates. Foremost among the kindred spirits was an entity calling itself “I am Tammy” who warmed up to me. Since this persona was using the America Online maximum of 10 characters, I was intrigued. Who-



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ever's fingers were behind the words, the mere name "I am Tammy" proclaimed itself female with all the preposterous overstatement of a transvestite intoxicated by the artificiality of his/her own facade. I am Tammy was as nice as I was mean. When people entered a room, I am Tammy would welcome them with a personal hello. She also would periodically offer drinks to the ladies with a festive "[S TADA]" – a command that produces an audience applause sound in computers programmed to respond to it. I am Tammy kept typing LOL – "laughing out loud." I became convinced this effervescent character was not anatomically female.

Online forums are a good place for transvestites and transsexuals. No lipstick or skirts, let alone surgery or estrogen injection,

tedly easier than its real-life counterpart, it still takes effort, motivation, and skill to put up a convincing false front for any length of time. Any man who has been with a fair number of women probably has enough of an impression of what women are like to sense their difference in conversation as well as in bed. Fourth, I believe that deep down, most people want to be accepted for what they are, not for some experimental pose they dream up on the spur of the keyboard. I mean, I could have written this essay under the name of Catherine MacKinnon, but then you wouldn't be accepting me for who I am, right? Besides, it'd be difficult to keep up with the convoluted nest of gender-based lies.

I did not want to be taken seriously. One of the reasons I am Tammy found me amusing,

and lust caused an immediate problem. In my furious typing and hyperkinetic excitement, I was contacting all and sundry without true regard to conveying a continuity of personality. This amused I am Tammy but confused others.

One of these others was someone whose stats said she was a 15-year-old girl. She contacted me, it appeared, out of a feeling of kinship. Without much empathy for her youth, I revealed to her in private that I was, alas, a 35-year-old male with a 9-year-old son.

When I explained that I was flirting with her and inquired as to her virginity, as well as revealing the age of my own loss of virginity, she became upset. "I don't FLIRT with 50-year-olds!" she screamed. It dawned on me that she was indeed the 15-year-old she claimed to be.

I began ignoring her IMs, but the damage was done. She announced to all in the room that I was a "PERVERT." She was hysterical and I was sorry for that. I had merely discussed sex and taken an initially nonfaterly interest in her. I did not propose indecencies nor attempt to procure her address.

Later, I had my doubts that she was a 15-year-old female herself – could such an accomplished typist/correct speller be as young and innocent as she claimed to be? I found her vilification of me unwarranted and irritating. I proclaimed my own 15/f status with renewed vigor. Her capital-letter announcements that I was a dirty old man preying on underage girls only focused my resolve to convince others that I was indeed a 15-year-old girl. For all I knew, the girl could have been a man just more wily than I.

The next day when I logged on, I found a suspicious number of people claiming they were 15/f. To make the most of my new identity I had to do what other fly-by-nights and pathological liars do – I had to escape from the limited audience of those who were getting to know me all too well.

So I left the room that I am Tammy and I had come to dominate. With experience under my belt, I trekked the electronic flatlands to a room where no one knew me.

I was reborn as a cute 16-year-old girl from Manhattan, and this time I stayed in character. As a presumably experienced teenager, I quickly rebuffed most males. Those I rejected personally were perhaps luckier than those I completely ignored (pressing "cancel" on the instant message menu). It was a heady experience! I felt firsthand the thrill of manipulating males interested in only one thing. From our side, guys, it does seem cruel. But believe

First my stats said that I was 35/m (35, male). Then I was 22/f. Then I was 18/m. Then I was 13/f. I much enjoyed being 13/f. Especially after tossing off a flawlessly typed reference to a European philosopher.

tions, are required to make the change if you're a man hoping to pass as a woman. On the Net, you can work your personality like a novelist imagining a character. The only caveat is that, like the novelist, you must be consistent in your lies if you want to be taken seriously. Some may insist that net.imposters are predominantly men, but I believe that most of the people presenting themselves as female on America Online are in fact female.

First of all, unlike the public Internet, which started as a Department of Defense system and is still dominated by academics, computer nerds, and other geeky, socially awkward males, the chattier, easier-to-use commercial services like America Online, which now has over a million subscribers, have a greater percentage of women using them. Second, whatever the thrills of pretending, the normal homophobic male ego, even if accidentally falling into the role of a woman, does not actively relish imagining being fucked by other men, or giving elaborate descriptions of his fictive female genitalia. I've seen on a talk show the guy who pretends to be a woman on 900 lines, but he – if he is what he says – is not paying, but getting paid. Third, the longer you talk to people lying about their identities, the greater the chances that you will cross them up in their lies: while electronic transvestitism is admit-

I think, is that I changed my stats about every 14 seconds. People like to find out whom they're dealing with, so they check that person's stats. A stranger can query "age/sex check" or "location check" and people will answer or not, truthfully or not.

First my stats said that I was 35/m (35, male). Then I was 22/f. Then I was 18/m. Then I was 13/f. I much enjoyed being 13/f. It was especially satisfying to be a 15-year-old girl after tossing off an esoteric epigram or a flawlessly typed reference to a European philosopher.

The people who had not seen me contradict myself – who had not seen my previous incarnation moments before as a different sex and age – took me seriously. They accepted artifice as fact. Some skeptics did not buy my statements as those of a 15-year-old girl. But many were duped. I had rediscovered the power of the prank. Even my brief forays into hermaphroditism (mf/28/Duluth) were given fleeting credence.

I began to see how the adoption of a certain age and sex would attract or repel certain people. When presenting myself as female, I perfunctorily dismissed those males foolhardy enough to attempt to contact me personally via an instant message. At the same time, I had not relinquished my male desires to bed as many beautiful young women as possible. This balancing act between artifice

me, if you are the one rejecting the desperate creatures, it can be downright fun.

One evening, Fired16 messaged me. I pictured Fired16 as a bored fireman using the station computer between calls. "What can you offer me that other women haven't?" inquired fireboy with a bluster I hardly found charming. I summarily insulted him, but this only seemed to fire (so to speak) his imagination. He was not to be deterred.

"If you are as ugly as you are stupid," my 16-year-old girl persona told him, "making love to you would be like tongue-kissing left-overs drenched in urine." He left me alone.

Emboldened by my successes and new persona, I forged ahead in the common room. Unlike during my previous foray, this time I was not going through any wild personality gyrations. I was a smart girl – always. Other girls (or at least those presenting themselves as girls) were getting more attention than me. But I knew what guys wanted. "My breasts," I wrote, "look better than these (*)(*), my butt is cuter than this)("

I found it more satisfying to be the girl every guy wants than to be just another lame guy trying to get her.

Yet despite all my shenanigans, I was still a cybervirgin. But not for long. Somewhere in Georgia, a supposed 25-year-old blonde, BxmOne, clicked her mouse onto my name. Perhaps she read my profile and found it devoid of pertinent biographical information. All she would have seen was a female dash – not too informative. (Every online user can write a profile listing sex, age, marital status, hobbies, and a favorite quote.) In any case, she IM'd me. At this point, the reader might wonder what on earth would have led me to assume that a person claiming the dimensions 58-26-54 was even a woman at all. Indeed, this thought immediately occurred to me. Though hardly homophobic, I was not about to be tricked into having cybersex with a clever man. Nor did the name BxmOne overwhelm me with confidence. Indeed, I found it rather unlikely that a real woman would refer to herself with such flagrant disregard for her inner qualities.

"First," began my little inquisition, "are you a real girl or a queen?"

"What's a queen?" came the somewhat delayed instant message, superimposing itself over the rest of my text like the intense glance of a stranger across a crowded room. Needless to say, the "woman's" comment that she did not know what a queen was struck me as highly disingenuous, considering that it could have originated in the twisted heart of a social

deviant like me. I was on my guard! The deceiver was not so easily deceived!

Nonetheless, my male mind could not help repeating – what if she was a woman? On the off chance that she was, I explained the slang meaning of the term queen I had thought universal: "It's a transvestite or effeminate male homosexual," I wrote. She affirmed she was a real girl. So: I asked her what she was wearing. She had on, she said, a yellow top, shorts, and undies. What kind of undies, I wanted to know. "White jockeys," she said. The back of my neck prickled in anticipation of the mockery "BxmOne" might be making of me. White jockeys – I'm sure. I pictured a cagey old queen having fun with me. But ... but ... again I held my paranoid tongue. All this time I had forgotten that this Georgian woman was imagining me as female.

I set up a further test for her. "Who is your favorite musician? Who is your favorite author? What is your favorite color?"

"All these questions!" she typed, but her answers came quickly and rang true to me. (Lest you think me hopelessly naïve for believing she didn't know the meaning of queen, I later met, in Illinois, in real life, a 25-year-old Mexican-Irish girl who, when I told her this story, was also unacquainted with the slang term "queen." She was not stupid – she knew the exact location of the pineal gland. She also did not associate jockey underwear with boys.)

"What are you wearing?" asked BxmOne.

The question took me by surprise. I looked down. "Beate boots with zippers on the side, grey-and-black striped slacks, and a turtle-neck. My socks, I'm afraid to admit, are white."

I had answered truthfully, giving her details that would allow her to form a mental picture of me. I shifted slightly on my chair, anticipating the seduction of young, lustful BxmOne. There was the usual beeping noise as BxmOne's instant message announced its flashing arrival on my computer screen. She had told me it was hot down there in Georgia. I, of course, was immediately thinking about how to ease her out of her skimpy clothing.

"Would it be forward of me at this point in time to ask about your breasts?" This was an instant message to me and it brought home, with full force, the depths of my own role playing. I paused.

"Yes," I answered, "it would." I was so concerned about her sex, I had forgotten I was lying about mine. But now, as things grew hot and heavy, I could not go back. Surely it would

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break the romantic mood – the trust. From her profile, I knew that BxmOne liked men.

But she had formed a mental picture of me as a woman. I could not disappoint her.

"I'm sorry," came Bxm's instant message.

"It's OK," I capitulated quickly. "They're small, but cute."

Things proceeded apace. Suffice it to say she imagined my delicate thespian-lesbian lips caressing hers. Adding – or perhaps subtracting – another layer of deceit, I told her to imagine me making love to her like a man. She acquiesced with pleasure. Somehow, my eroticism was being funneled through my fingers into BxmOne's remote form. She was doing this, doing that. The panties were ancient history. I reveled in the feeling of conquest. It was a feeling only partially mitigated by the fact that I was not who I was pretending to be.

Sex on the computer is not merely a means toward the end of real sex, or a replacement for sex. It is also an end in itself, a nearly infinite space where free spirits can commingle to the tune of their own inclinations rather than those of a watchful society. Sure, most cybersex is as predictable as the real

kind. But the computer variety opens up new possibilities. It separates what we think of as the soul – inner self-awareness – from the body, allowing us to create ourselves anew. It's aesthetically thrilling.

As long as the written word remains the primary network medium (which may not

To make the most of my new identity I had to do what other pathological liars do – I had to escape from those who were getting to know me too well.

continue for long), cybersex will stay the greatest boon in the history of erotic writing. Cybersex merges the delicate wit of Victorian belles-letters and romantic poetry with the real-time responsiveness of two lovers going at it.

Yet another plus is cyber-reality's ability to reproduce the erotic atmosphere of a Renais-

sance masquerade, since behind our masks we are no longer as inhibited as we would have been had our real selves been on the line. Yet these masks work only if they are not true lies – that is if they accentuate the truth. On America Online, I understood more fully than ever before the origin of our word "person." Before the Latin *persona*, meaning role, the word was the Etruscan *phersu*, or actor's mask.

Still wanting to dominate BxmOne in a masculine manner, I had her turn around in her mind's eye and submit to my cupping hands and fervent caresses. Submit she did, of which I was glad. Still unsatisfied (desire online is especially interminable), I had BxmOne imagine a man entering the room, one who was dying to engage her in forbidden pleasures. But, just as cavalierly as I had produced him, I ordered him to leave the room. Then I brought him back. I cannot recall whether it was a minute or so later before I had this dapper individual reenter the room as I was still pleasuring BxmOne in cyberspace.

It didn't matter. I was still typing like a banshee when BxmOne interrupted to

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announce she had achieved orgasm when the man had entered the room. "I just came," she wrote. "You are so passionate!"

I pressed return but my IM did not reach its destination. "BxmOne," the computer informed me, "is no longer online."

With a little postcoital half-smile, I leaned back in my mother's office chair, proud of my seduction of this hot, unseen angel from the south. Not only had I never had cybersex before, but I had never experienced firsthand what it's like to play a lesbian. Days later, I would watch the lesbians clustered outside the Coffee Connection in my home town of Northampton, Massachusetts, in a new light. I felt like Casanova. It was a human experience, a personal and intimate one – but one made possible by the computer.

My editor remains "utterly convinced" that BxmOne, and indeed everyone in this story, is a guy. It's possible, but I doubt it. I mean sure, BxmOne could have been the dyslexic, anorexic brother of a hemophiliac pair of incestuous Siamese twins, but she could also have been a young woman experimenting sexually in a forum free from those Four Horsemen of the sexual apocalypse: pregnan-

cy, sluttiness, rape, and AIDS. If I were a horny young female virgin, I might well take my first tentative trip across the minefield of modern dating protected by the anonymity of cyberspace. Call me crazy, but I don't believe that it's only men who troll for sex online. Women, however, have a greater requirement

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for safety. And outside of masturbation, no sex is safer than cybersex. For all I know, BxmOne could have been a guy. For all I know, he could have been a girl. It's not something I plan to lose any sleep over.

Once I had learned how to use a name other than my mother's, I had other experiences – all as male. Still using my mother's tag, I

seduced a young "woman" from Minneapolis who could see the Metrodome from her apartment. "Be gentle," she told me, "I'm only 110 pounds." When I half-voyeuristically threatened to reveal to others in the common room what we were doing (she had been "flirting" with them, I jealously felt, instead of devoting her undivided attentions to our more salacious activities), she quickly disappeared.

I think some real fear of being found to be other than a nice girl came over her. As the personage "Foolaroun," I had my way with BaronS of Brockton, Massachusetts. She budied up to me when I dropped the name of hometown fighter Marvin Hagler. Though only 16, she stole away with me into a private room (which she christened "Dog") for an afternoon interlude. Her typos were consonant with her alleged age. It was my first time in a private room. Like a woman asking a rake for his address, she told me to e-mail her, but I never did.

Perhaps my most ambitious persona was Lust Angel. I invented this persona while stoned and online. One lovable but foul-talking youth was disheartened to learn of the number of males in the room around him.

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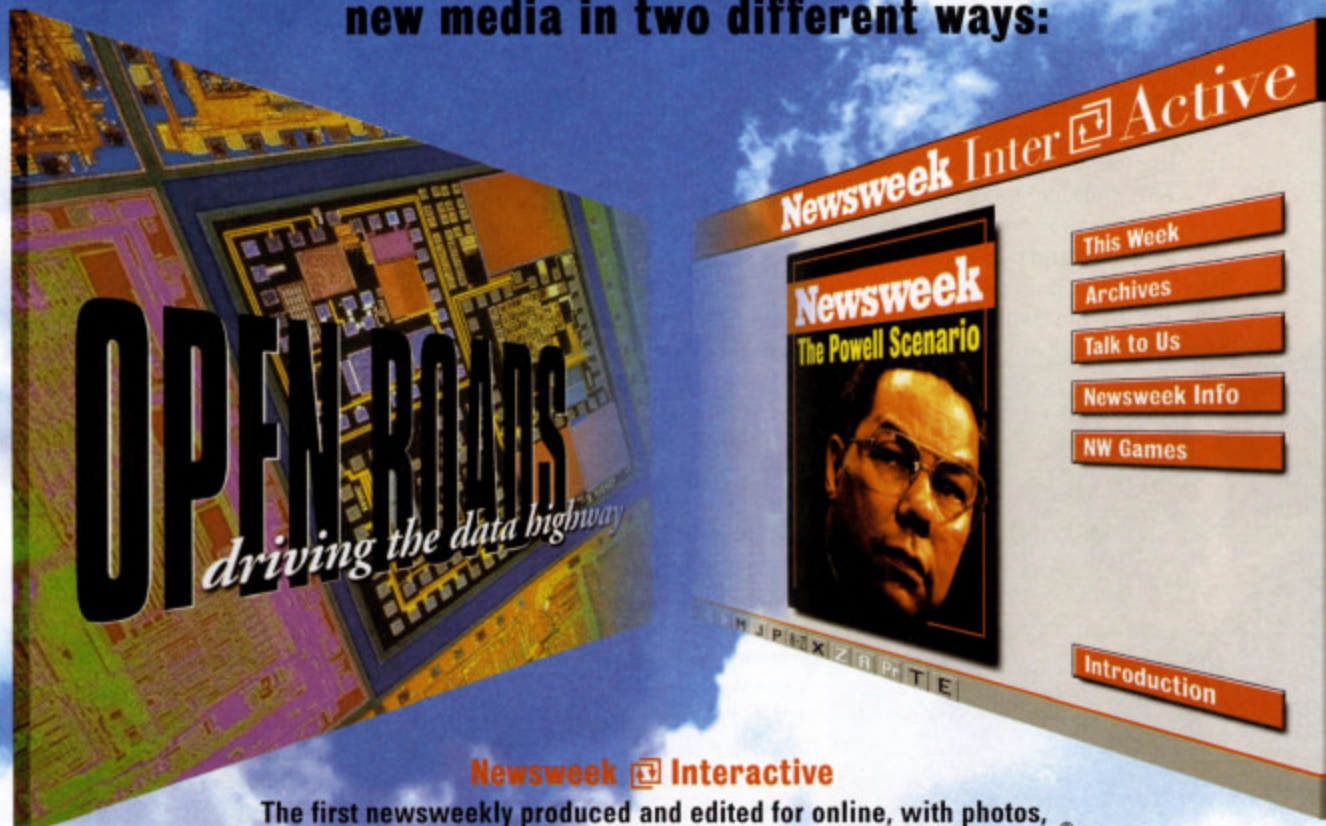
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Child's Play

Hollywired start-up daVinci Time & Space

is creating the first interactive television environment for kids.

By Connie Guglielmo

DaVinci Time & Space, a start-up now in its second year, plans to become the first provider of an interactive television (ITV) station for children. "Our goal," says Jeff Apple, daVinci's CEO and co-founder (along with Carol Peters), "is to make an environment where kids love to be and parents love having them spend time."

DaVinci has created prototypes of the shows, games, and ads the company plans to sell, running the pilots on an Ethernet network of Apple Macintosh and Silicon Graphics Indy machines. The next step is to convince the cable TV and telecommunications companies beginning trials of interactive-television delivery systems – including Time Warner Cable, AT&T, Pacific Telesis Video Services, GTE Corp., and U S West – to add daVinci Time & Space to their programming lineup in tests that will start later this year.

If Apple and Peters are successful, they'll convince one or more of these ITV providers to make daVinci part of the basic lineup of programming offered to subscribers who will pay a base rate for interactive TV services, just as they pay a base rate today for their cable TV. To understand ITV, think of it as an extension of today's cable TV model: when you hook up to cable today as a basic subscriber, chances are you'll get the major broadcast networks – ABC, NBC, CBS, Fox – as well as a few cable channels like CNN or TBS. DaVinci wants to be among the basic channels you get when you pay U S West, Pacific Telesis, GT&E, or another provider the monthly fee for ITV service.

Before developing a prototype, daVinci had already lined up strong funding and impressed analysts. For starters, Peters and Apple had convinced Venrock Associates – the venture capitalist arm of the Rockefeller family and an early investor in Apple Computer and Intel Corp. – to support their project. The two other major investors in daVinci are Oak Investment Partners, which funded

videoconferencing developer PictureTel Corporation and Seagate Technologies, and Greylock Management Corp., which has successfully invested in Continental Cablevision and Avid Technology. Together, the three investors have poured nearly US\$5 million into daVinci.

While analysts and even ITV service providers acknowledge that it will be anywhere from three to five years before the technology infrastructure is in place to deliver ITV content to a mass audience, daVinci is jumping the gun by developing a content-delivery environment before the details of technical delivery systems are hammered out. Clearly, the company believes the way to set the standard for an ITV channel is to become the first one with a concrete example of how ITV content should be delivered to consumers. Tom Melcher, in charge of strategy and development for daVinci, calls this "the first mover advantage," citing the way CNN set the model for what a 24-hour, all-news network should provide – chiefly by being the first ones to do it.

"CNN established a brand awareness and market presence that was very difficult for the follower-ons to knock out," said Melcher, who was most recently a start-up consultant for Q2, a subsidiary of electronic retailer QVC Inc. "It also has a real skill advantage. To create news 24 hours a day, you had to define a new way of doing business. They made it up as they went along. Much of what we're doing is similar."

So far, industry analysts think daVinci's strategy may be the right one. "Given that basically no one has any products out there, because the infrastructure hasn't been settled, their approach and the thoroughness that they seem to be putting into planning and tracking the market seems very appropriate," says Steve Reynolds, who has been closely following ITV developments as director of interactive multimedia research at Link Resources Corp. in New York. "They're doing something that is distinctive, that has a focus. It's refreshing that they're doing their homework first."

Peters and Apple bring an ideal partnership of technology and entertainment know-how to daVinci, which takes its name from the Italian inventor whose hallmark was merging concepts from art and science. "He's art" says Peters, gesturing toward Apple. "I'm science."

Peters, 47, is an experienced Silicon Valley technologist. Reynolds describes her as being "very on top of things." While director of engineering at SGI, she led the project team that created the Iris Indigo workstation. Before that,



Jeff Apple and Carol Peters have lined up strong funding and impressed analysts with their vision of programming for kids that even parents will like.

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she spent 16 years at Digital Equipment Corporation as the engineering manager of DEC's first RISC-based workstation. Apple, 45, is the entertainment- and content-savvy director/producer. His credits include founding Apple Production, a Los Angeles-based company. He has also produced four feature films, including the recent *In the Line of Fire* with Castle Rock Entertainment and Columbia Pictures.

To make sure the company retains its technology-entertainment heritage, daVinci has two offices: a base of operations in San Mateo, California, near the Silicon Valley, and a Hollywood office in Los Angeles. In keeping

ware is doing what when all depends on what the offered programming is and what the kid decides to do," says Peters. "The kid looks through some kind of sourcing mechanism, a navigator or some kind of browser, and says 'Take me there.' The selection causes a virtual circuit to be created between the house with this kid in it and the daVinci Time & Space server."

While some of the major technological elements of the system have yet to be determined—like which of the still-developing set-top boxes for ITV will become the standard platform—determining that kids should be their audience was an easy decision. "Kids

While analysts and even ITV service providers acknowledge that it will be anywhere from three to five years before the technology infrastructure is in place to deliver ITV content to a mass audience, daVinci is jumping the gun by developing programming now.

with the interactive nature of the company, the two offices are linked via a live desktop videoconferencing system that is on 24 hours a day and allows the company's seven-member staff—which was culled from Disney Software, 3DO, SGI, and the Massachusetts Institute of Technology Media Lab, among others—to see each other.

With the Los Angeles office visible in a small window on screen a few feet away, Peters, sitting in daVinci's sparsely populated San Mateo high-rise, launches into a nuts-and-bolts description of the company's plan. "We're creating a programming service that will be made available in an interactive home. That is a home that has been wired by some carrier such that the television has connected to it a set-top box. Through the wiring and network, it will link up to a server that is capable of delivering digital programming into that home."

In computer terms, Peters describes the relationship between the TV viewer and daVinci as a large-scale, distributed client-server network. "When a kid sits in a house, holding a remote, and says, 'DaVinci Time & Space, please,' a certain piece of software is downloaded through the network into the set-top box. That client-side software starts running the set-top box in cooperation with its other half, the server-side software. Which soft-

are the perfect market for any kind of new interactive media because they are interactive," says Apple. "They want to touch, they want to move, they want to explore. They're not afraid of any new technology, and this to them would be as simple as picking up a pencil or crayon."

Peters jumps in: "We have a lot more confidence that kids will be able to figure this thing out than their parents will. Not because it's difficult, but because kids don't have any kind of mental barrier that says, 'I don't know how to do this. I don't know what this interactive stuff is.' They're not going to feel embarrassed or threatened."

Analysts like Reynolds believe that the focus on kids is a good choice. "Our research shows that children's-oriented programming will be a huge driver, generally speaking, for media and for the ITV industry in particular," said Reynolds, citing both demographic forces and the success of other children's TV ventures, including Children's Television Workshop (creators of *Sesame Street*) in the broadcast television world and Viacom's Nickelodeon network on cable TV.

"There's a sizable portion of the adult population with kids or getting started on having kids. The need or a feeling of need for support materials that reinforce your kids' educational process is very strong. We've found

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that there is a palpable need for electronic activities that are contributing something to a child's education beyond staring at a screen. It's that need that's selling a lot of multimedia computers right now in the mainstream market, and that's affecting the mix of CD-ROM titles, educational titles, being bundled with those machines."

DaVinci's supporters agree. "The focus on children was something that was not a capricious conclusion," says Venrock's David Hathaway, who now sits on daVinci's board of directors. "Children, with their proficiency with computer games and electronics, will be able to accept this world more than middle-aged folks. The underlying philosophy is that education doesn't have to be dull and boring. It can be enjoyable, and it doesn't have to be constrained to the classroom."

When kids tune into daVinci, they can expect to find an electronic theme park, a virtual Disneyland where they can visit the same attractions over and over again, says Peters. In addition, they'll find new attractions added overnight, lots of interesting characters wandering around, and also other visitors to daVinci Time & Space, namely

other kids who have tuned in at the same time. "When you tune in and get your first screen, you find yourself in what we call a place. The general way to describe a place is to look out the window," says Peters, gestur-

When kids tune into daVinci, they can expect to find an electronic theme park, a virtual Disneyland where they can visit the same attractions over and over again.

ing toward the busy highway interchange and business park visible from the company's windows. "That's a perfectly reasonable image of a place that you might see. DaVinci has a lot of different, highly realized places, and each place has a set of different characteristics that makes it this place as opposed to that place. It looks like television, and it looks like film. We're using both rendered environ-

ments, with computer graphics, as well as filmed environments."

And once you're in a place? "You are there, and characters are there, very specific interactive characters," adds Peters. "Those are fully realized characters, like fully realized characters in *Sesame Street* or in a movie or television show."

For Apple, it's the story-telling possibilities and the audio communication among daVinci kids - kids will be able to talk to other kids using microphones - that most excite him about the service. "Because there's two-way communication, it becomes more of a community experience. Kids will not just be closed in some confined cyberspace," Apple says. "It also becomes more of a complete kind of story environment, which you wouldn't get in traditional television today. If you watch a weekly series and miss an episode, you've missed it because you weren't around to watch it or you forgot to tape it or you didn't know how to turn on the video machine. But with this service, if you're not there tomorrow, you're not going to miss something, because it will be there the next time you tune in."

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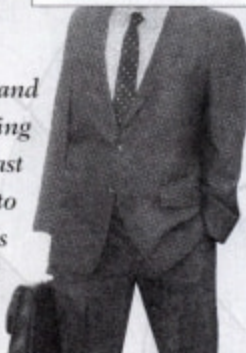
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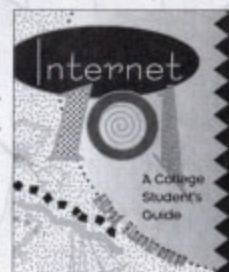
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That story-telling continuity is possible, explains Peters, because of the client-server nature of the system. "We know who the kid is and we know what that kid does. So if we're talking about drama and telling a story, a kid is not going to miss a piece of the story because he or she doesn't have to be there at a particular time. If the kid is in this place and at a certain point in a story, and then goes away, our system remembers where they left off."

Unlike prepackaged CD-ROM titles and games or linear television shows, daVinci's places will be constantly revised. The entertainment content will be created by daVinci itself, third-party providers, and, most impor-

The ethics of including advertising disguised as "content" is something that daVinci says it's spent considerable time thinking about. It has already set a few guidelines, such as a rule that kids won't be able to buy things on the air.

tantly, advertisers, who will fund the service. "In cable terms, we hope to be a basic service," says Peters, explaining the plans to convince ITV providers to carry daVinci. "When homeowners or bill payers pay for interactive cable service at whatever the basic rate charged by the carriers, we plan to be a part of the basic service. We'll be able to make it available to such a wide audience because advertisers, not the viewers or the ITV service providers, will be footing the bill for the service."

With initial help from daVinci, advertisers will create places or interactive advertising components that can be incorporated into places. Like other content, advertising will have to be as compelling and entertaining as other interactive elements, or kids simply won't choose it. That, says Apple, means that advertisers will have to rethink the way they promote their products.

"Advertising will have to entice kids and convince them to interact. If they do interact, then you're taking advertising to a new level where everyone wins. Children will win because they're empowered to decide for themselves what they want to do and when. Advertisers win because they will get a sense of who's reacting to their ads and if there's any interest. It's not just mass marketing hitting 9 billion people at the same time. In this case, it becomes more like vertical

marketing, in which you really zero in on individuals." The ethics of including advertising disguised as "content" is something that daVinci says it's spent considerable time thinking about. It has already set a few guidelines, such as a rule that kids won't be able to buy things on the air. Peters says kids won't have any way to order something in an ad. He's heard too many horror stories of kids who log on to their parents America Online or CompuServe accounts and rack up \$500 or more in a week. "For adults, there will be plenty of interactive stations where you can choose to buy right away. But that won't be part of daVinci's programming."

Ultimately, daVinci's founders recognize their success will depend on how well they

live up to their mission: to create a place that kids love to be, a place parents love having them spend time, and to convince ITV providers to carry daVinci. As this article went to press, daVinci claimed that it was on the verge of signing major deals with several national advertisers and several of the ITV projects around the country.

Peters and Apple hope their philosophy about kids, education, and entertainment, coupled, of course, with their technical expertise, will carry them through. Apple sums it up: "You have so many great tools in the interactive media to make it really compelling and to draw kids in. But it doesn't mean that every educational experience has to be this incredible entertainment thing. If it's highly interactive and well done, kids will learn but won't realize they're learning, because it's fun. And that's what great education is about: it should be exciting to learn, it should not be punishment."

Tomorrow's potential couch potatoes, take heart: daVinci is doing everything it can to make sure that it's in the right place at the right time to convince ITV providers to tune into their vision. ■ ■ ■

Connie Guglielmo, a former editor at MacWEEK, is a San Francisco-based freelance writer. She can be reached at connie.g@applelink.apple.com.

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A Note from the Future

Passed on to us by Cathy Camper

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HA HA Wish they cold truly see how futur is relly. Al rich foks plug in to a vertul reelity Masheen, wich is lik wakin into a bilbord whats cleen with a Patry goin on an peepI not sik but hapy in there NIS cartvon.

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Yes, tru naf the worl be wakk in on air, be zoming on a computer scren, buzz an evry dog cor thim jes lik olen tim boks did say. But the other haf, they me, livin in the reel ~~worl~~ wirl, wich you lef ames. Yes, we werin plastik clos. But they slimmy 1970 poly eser from the y usd clos stor. Yeh we vizoolizin reelity. But it a dum karaty gam for 25 sent. An they shet rong abot 1 thing, We not werin any mohaks, in this futur now. WE so cris dog col, we grow har lon jes kep us warm.

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lin stuf, that WAS us. Proibly I AM femal, proibly I got no job And
lotsa kids. Proibly. But how yo gonna now? Im not plugged in.
I AM st, ll A Bode. Some bodee stik in Actual ree'lity.

So I Ask yo plez, to red this wel AN I hop I can be in yur
skool. I do not ask to be a computr jok or a sistim anilis, but
jes can I beter myself, AN make say enuf my husband AN me
by A kid. Besum kin of tru blu family be jus lik the boks, only
I ned axes to a computr soon, or to bad, I beloss an it will
be to lat.

Universal Service Does Matter

By Rob Glaser

Not because you're a
bleeding heart, but
because you're selfish.

"When I gave food to the
poor, they called me a
saint. When I asked why
the poor were hungry, they called
me a Communist."

— Dom Helder Camara, Brazilian Roman Catholic archbishop,
author, and Nobel Peace Prize nominee

One of the surest ways to get labeled a communist in cyberspace is to merely raise the question of universal service. To many, the idea of universal service—that ubiquitous access in and of itself is a worthy public policy goal—is inextricably linked to an archaic, centralized, paternalistic, and discredited approach to government. Some, such as John Browning—who championed his ideas in *Wired* 2.09—would like to proclaim the concept dead, and be done with it.

But, like apple pie, baseball, and bombast in Oliver Stone movies, universal service is a fundamental part of America, and is not going to go away any time soon. Moreover, it shouldn't. There are good reasons—both selfish and high-minded—why we should try to achieve an effective form of universal service for the infobahn.

The monopoly on local telephone service is being broken up, haltingly but inevitably, and this in turn will break the method by which nearly universal phone service has been financed. Rigid, centralized attempts to achieve universal service for any future communications infrastructure just won't work in the brave new world of competitive, decentralized broadband networks.

So, fine—let's not be centralized. But let's not throw out the baby with the bath water. The basic reason that universal service has been an important goal of telecom policy since the 1930s is that Americans want the American experience to be inclusive and broadly participatory. Inclusiveness is important for both personal and community reasons, for the same reasons we have public schools and a federally funded interstate highway system.

We all benefit from the legacy of our interstate highway system, which provided money to pave roads in New York and North Dakota alike. Consider what would have happened if we had not established a national highway policy after World War II. Instead, let's say we just licensed right of ways to entrepreneurs, as was done in the 1980s with cellular telephony. We would have gotten some kind of interstate highway system, built by entrepreneurs. Granted, maybe it would have been built for less money. But the pricing and national coverage of this highway system would have resembled today's cellular telephone network. Certain parts of the country, such as the northeast megalopolis, would have developed four-lane roads fairly quickly. Other regional roadways, such as the I-5 corridor linking Seattle to Los Angeles, would have developed organically as well. But less well-trafficked areas would probably have been served by gravel roads for many years.

The biggest problem with locking in on a universal-access plan is that nobody knows what the essence of the infobahn will be. Fiber-optic cable to everyone's home? Specific applications such as video-on-demand

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or interactive home shopping? Even if we did know, which infobahn services would we consider truly essential? Basic e-mail? The multimedia successor to plain old telephone service? Anyone, including government officials, who deigned to "know" the answer today to any of these questions would be exhibiting only arrogance.

The best practical step we can take now is to broaden the range of trials being undertaken. For instance, why not persuade U S West and Time Warner that, in exchange for receiving regulatory approval for video-on-demand trials in places like Omaha, Nebraska, and the wealthy suburbs of Orlando, Florida, they should help subsidize nonprofit efforts to run trials in rural Nebraska and in Harlem. I'd bet that some foundations would kick in a few bucks, too. Such trials – combined with the continued organic growth of freenets, library-access programs, and other community-based projects – would generate meaningful information on which

infobahn applications are essential to all Americans, and hence ought to eventually become the focus of universal-service programs.

While none of us knows exactly what services will develop over the nascent broadband network, I'd bet that nearly all *Wired* readers will agree that the infobahn will not be an ancillary service, but will be central to how Americans work, learn, and communicate. It is precisely because of this centrality that we need to talk about universal service – what it should be, what it should not be, and how we can achieve it. For without a thoughtful universal-service policy, cyberspace could well end up as alien and cost-prohibitive to the general public as venturing out of town was during the reign of medieval highway robbers.

Rob Glaser (robgl@halcyon.com) is founder and president of Progressive Networks Inc.

No News Is Good News

By Phil Patton

How about a channel about what's really happening on earth – namely, nothing.

When Orson Welles was planning his notorious 1938 "War of the Worlds" radio broadcast, he decided to set his spoof in some Everytown, USA. To choose one, he closed his eyes and plunged a finger onto a map. When he opened his eyes, he found that digit on Grover's Mill, New Jersey. On October 30, 1938, Welles's faked "live-action" account of a Martian attack on a small New Jersey town sparked panic along the Eastern seaboard.

But what's the news *these* days from Grover's Mill? What happens there when Martians are *not* landing? Grover's Mill is the place that comes to mind when I wonder why we don't use broadcast television for more than news. It is the place that makes me ask why, when we have department-store video security and parking-deck video security (see "Caught" page 116), we can't also have a means of global video security.

Broadcast television brings us word and image of the new and the novel, but why have we never thought to use it to bring other kinds of information? And in answering that question do we answer the other, perennial question: Why is there no good news on TV? Consider that closed-circuit television brings us mostly the old and same, the constant and unchanging. Do we perhaps need a set of video security cameras for the whole world, a new kind of TV that offers not only the new and novel but the old and the same – the routine of life in a village square, a town center, a savanna, or a prairie.

TV, that is, from the Grover's Mills all over the planet – from Tibet or Ghana, Taipei or Tirana. Here's the idea:

spin a globe and throw the darts. Station six, ten, a dozen cameras randomly around the globe, feeding into unused or underused cable channels. Run them all the time.

Why? To remind us of how little is happening most places most of the time, as a useful corrective to our obsessive and driven sense of news.

NASA talks about its "mission to planet earth," the use of the space shuttle to survey the distant reaches of the globe. So think of these cameras as a kind of extraterrestrial probes deployed from some distant civilization, landing in random locations. What would the Martians really see if they landed here?

Sure, there are potential problems to be worked out. What happens when someone sets up a billboard in front of the camera? When the shop owner rents advertising space by the hour on the side of his store, which just happens to be in the view? When lines of hundreds form just to wave and smile and enact the NFL sideline "Hi Mom"? Do you attempt to control these effects, or let them happen, as incidental results of a kind of conceptual project?

All this can be part of the experiment, side effects to the main therapy, which is to change our sense of the world. Think of it as a world video security-camera system, because nothing would contribute more to our sense of sharing a planet than a sense that we hold banalities in common.

We might better imagine the true meaning of "global village" if we remembered it includes Grover's Mill.

Phil Patton (pattonp@pipeline.com) is a contributing editor to Esquire. He is the author of Made in the USA.

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When the return-of-the-

repressed came,

and the Communist regime

cracked and fell apart,

these mad Czech hippies

TRIUMPH

acquired a cultural authority

OF THE

and credibility like no mad

PLASTIC

hippies have had ever before,

PEOPLE

anywhere, any time.

Bruce Sterling reports from

Prague in this, the sixth year

of the Velvet Revolution.

Photos by Antonin Kratochvil

September 17. I'm sitting right now at a big wooden desk in a Ruská Street apartment house in Prague, typing on a Power-Book 180. In the only country in the world where the president is a revolutionary literary intellectual, there's an arcane Kafkaesque pleasure in typing immaterial electronic words into this silicon box. *Literatura*, words-in-a-row, still means something here in Prague. A lot of odd guff is talked about this town, but when they said that Prague was literary, they were living in truth. This is probably the most utterly literary city on the planet.

My hosts here on Ruská Street are a publisher, Martin Klíma, and his wife, the Czech fantasy novelist Vilma Kadlečková. Martin publishes novels because he feels that this is the sort of thing one ought to do, and to make money, he publishes boxed sets of Western role-playing games, which sell very well. Vilma writes fantasy novels – she's been weaving complex fantasies since she was a little girl – and to make money, she works as an editor of Harlequin romances, which have struck gold in the nothing-if-not-romantic female Czech population and are selling like crazy.

The desk I'm working on right now, in my hosts' cavernous, high-ceilinged office, has a big container of little hard floppies, an even bigger container of big wobbly floppies, a bouquet of yellow flowers in a vase, two short-story collections – one in Czech, one in English – a voltage converter, a QuickTake camera, an émigré magazine, a thick, English-language monthly calendar of Prague cultural events, some Czech rock tapes, a joystick, a printer, a pack of Dunhills, and a rotary phone.

They're all sweet and harmless little objects, except for the cigarettes, which are bad for me, and the rotary phone here at my elbow, which is truly a device from hell. This phone is an ancient Siemens pulse unit. Out the back of the set comes a yard of round-as-a-nooodle, gray Czech phone wiring, which ends suddenly in a splay of four bare wires: white, brown, green, and yellow. The green and yellow wires end in severed copper stumps, while the white and brown wires enter a small plastic doohickey. From the other side of this makeshift gizmo comes a flat American phone wire, with four little internal wires of its own. This time, the black and yellow wires are dead stumps, and the red and green wires are the unhappy survivors. This butchered American phone wire runs 6 inches and ends in a modem, and I don't mean a modem with a label or a shell. I mean a bare piece of green circuit board with some Malaysian and Filipino bit-eating caterpillars and a naked little tin speaker. Yet another American-style pinch-clip phone cord exits from this inert modem and trails into a Czech domestic phone outlet, which is an alien doorknob-like object big enough to brain someone with. And out of the bottom of this ceramic phone outlet comes a truly ancient length of round, pre-Communist-era phone cord, running down the wall, along the baseboard, and behind a towering glass-fronted bookcase of Czech literary classics, to god-only-knows what eldritch, electromechanical, Nazi-era, phone-switch destination.

My host Martin Klíma, who was a physics major and student firebrand during the Velvet Revolution of 1989, has an Internet address and a 486. He's got WordPerfect and Paradox and Corel Draw. By Prague standards, Martin is one wired dude. His wife, Vilma, writes her fantasy novels on a Leading Edge PC in the bedroom. It sits on top of her amazing steampunk sewing machine, which used to be a

Bruce Sterling (bruces@well.sf.ca.us) is author of five science-fiction novels, the nonfiction work The Hacker Crackdown, and co-author, with William Gibson, of The Difference Engine. Sterling edited Mirrorshades, the definitive document of the cyberpunk movement. He wrote "Virtual Hell" and "Compost of Empire" for Wired.

pedal-pushed manual unit back in the Pleistocene, and was refitted with an electric motor by Martin's grandfather. Martin and Vilma have one phone line. In the West they'd probably have 10.

On the subject of modems and phone lines, Martin and his '89er friends still talk about "the Japanese guy." Back in '89, Czech students were trying to coordinate the uprising across the nation, and the technical students, including Martin, were running the telecom angle. They used a 300-baud device with the size, shape, and heat of a kitchen toaster. The Czech secret police were far too stupid and primitive to keep up with digital telecommunications, so the student-radical modem network was relatively secure from bugging and taps. Fidonet BBSes were springing up surreptitiously on campuses whenever an activist could sneak a modem past the border guards. Modems were, of course, illegal. Most of the Czech cops, however, had no idea what modems were.

The police were engaged in the hopeless task of beating the population into submission with billy clubs, without the backup of Soviet heavy armor. Martin's independent student movement was smarting from street-beatings and sensed that '89 was '68 upside down. They had a list of seven demands. They were pretty radical demands: three of them were never met. Everyone knew the situation was about to blow. But getting the word out was very difficult.

And then, without any warning or fanfare, some quiet Japanese guy arrived at the university with a valise full of brand-new and unmarked 2400-baud Taiwanese modems. The astounded Czech physics and engineering students never did quite get this gentleman's name. He just deposited the modems with them free of charge, smiled cryptically, and walked off diagonally into the winter smog of Prague, presumably in the direction of the covert-operations wing of the Japanese embassy. They never saw him again.

There doesn't seem to be much doubt that this Japanese guy existed. I've talked to four different sources who claim to have seen him in the flesh. The students immediately used these red-hot 2400-baud scorcher modems to circulate manifestos, declarations of solidarity, rumors, and riot news. Unrest grew steadily. By late November, Václav Havel and the older-generation dissident intelligentsia were playing a big role in the demonstrations. Then the general populace took to the streets, and without Red Army backing, the puppet regime collapsed like a rotten marshmallow. By mid-December, the Civic Forum was in power.

Those were glorious days indeed. But all that was five years ago. Now Martin is a professional publisher, an ex-student pal of his is a member of parliament, Václav Havel is president, and this country, liberated by a miraculous mummery coalition of playwrights, actors, rockers, students, and hippies, is doing its level best to transmute itself into the functional equivalent of Luxembourg. This may have been the Temporary Autonomous Zone for about a year and a half, from 1989 to 1991. Right now, it is the Hopefully Permanent Capitalist Scaffolding Zone.

The Prime Minister, Václav Klaus, who is calling all the shots in this country, is a right-wing economist who openly admires the godlike genius of Baroness Margaret Thatcher. Unlike the British Tories, however, Klaus and his party are doing a pretty good job economically. Unemployment is below 4 percent nationally - in Prague, it's below 1 percent. Inflation, which was inevitable considering Czech socialist subsidies had no tangible connection to reality, is contained at less than 10 percent. The Czech koruna is becoming a real currency and could probably be made fully convertible tomorrow, if not for the fact that the canny Klaus thinks that might hurt exports.

And Prague has become one of the most popular tourist destinations in the world. The people of Prague have dislodged their Red Army overlords, but they are now under occupation by an army of tourists. About

Literatura,

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still means

something here

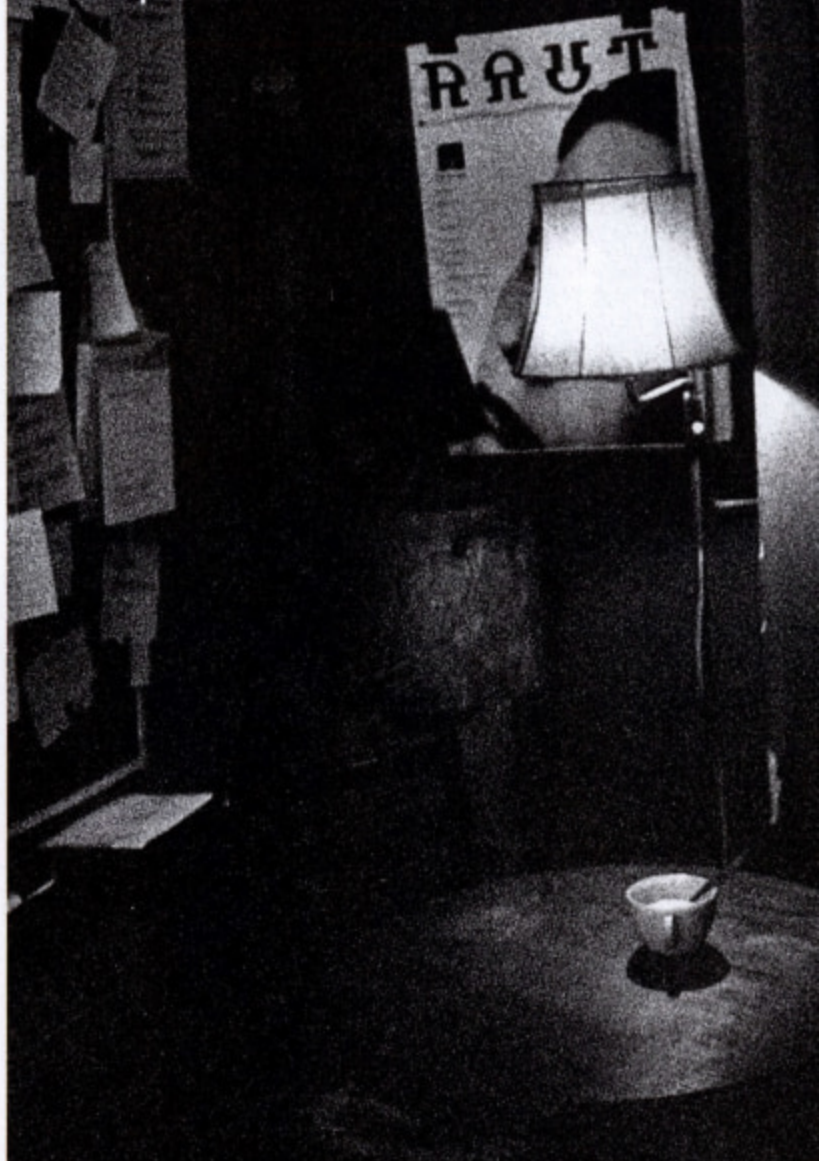
in Prague.

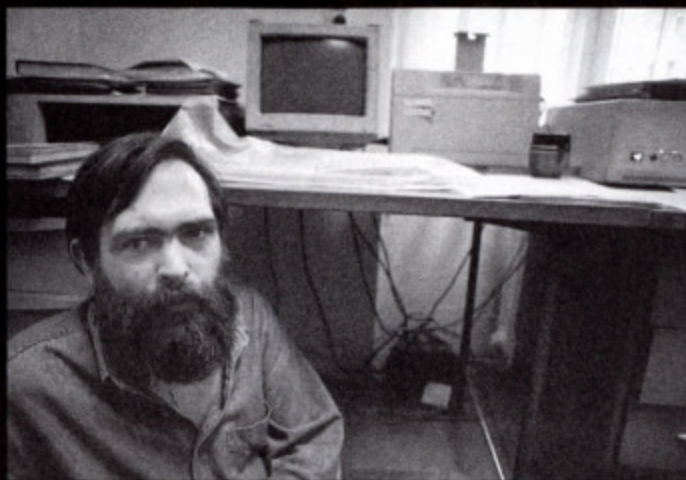
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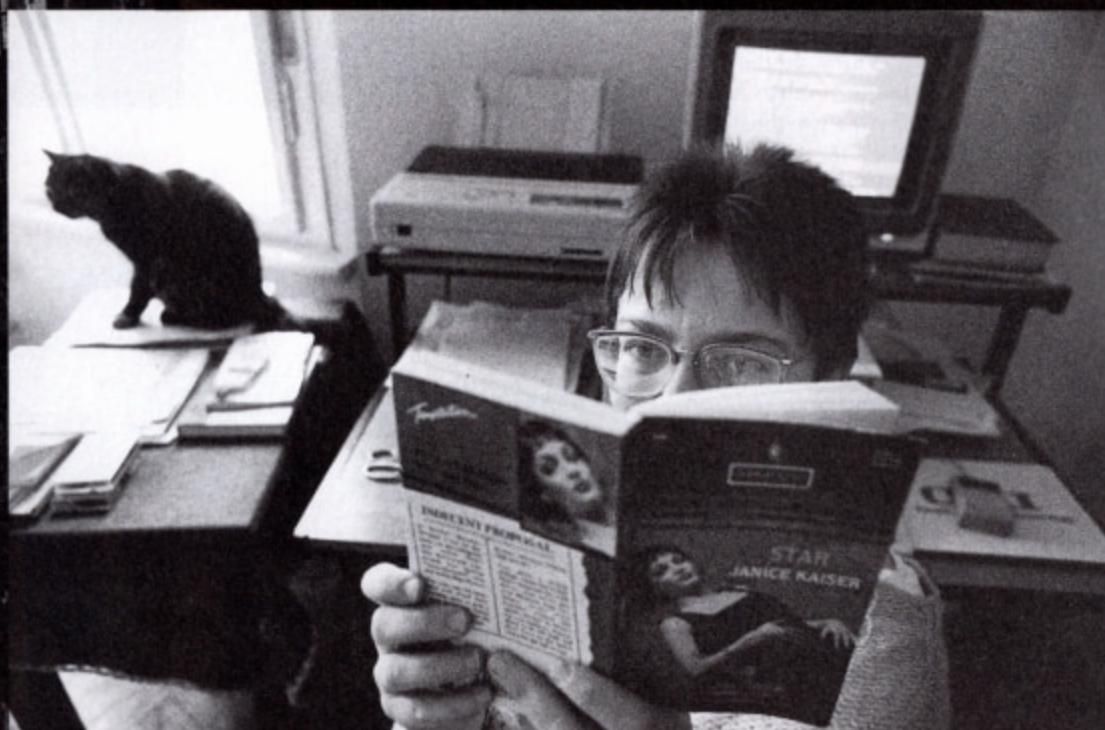




Lovers of *Literatura*:

Jiří Gruntorad

founded the Libri Prohibiti Library, which contains thousands of underground books and previously forbidden publications.



Eva Hauserová was one of the country's more influential science-fiction writers before the revolution. To make money, Eva translates Harlequin romances, whacking out translations on her PC clone in about a week.



Doug Hajek publishes the émigré literary magazine *Yazzyk*. It may not be the best literary magazine on the planet, but it's the best one to deal with this corner of it.

80 million of them a year. The Nation of Tourists comes here, and it spends money. Slowly, tourists and their money are changing everything about this place.

A lot of visitors fall in love with this city, for a variety of excellent reasons, and they try to live here. Some of them find a foothold in the crush and succeed in moving to Prague. A lot of them – a whole lot, somewhere between 8,000 and 12,000 people – are Americans. It's a rare and noteworthy happenstance – maybe the last example was Paris in the '20s – when thousands of Americans, most of them of the same generation, show up en masse, with some sense of common purpose, in one single (hospitable, if bewildered) foreign city.

The émigré community in this city is real, a genuine little island of bohemia in Bohemia. Prague supports three English-language émigré newspapers, *The Prague Post* (an actual weekly newspaper), *Prognosis* (the hipper, cultural, voice-of-the-happening-people rag), and the gray and tedious *Central European Business Weekly*, which is read by the capitalist gnomes.

There are quite a few American business people here, but they don't set the tone. The tone is set by graphic artists and wannabe musicians and common-or-garden slackers off to drink great cheap beer on Dad's money. There is an absolute load of poets. You can't turn around without tripping over a poet. There don't seem to be many novelists here, but when it comes to poets and short-story writers (the two most non-commercial species in the global literary enterprise), they are here in Prague in massive numbers, barking in utter joy like big-eyed Greenpeace seals on some ice floe beyond reach of the furriers' bludgeons.

Prague is very much like Paris in the '20s, but it's also very much unlike Paris in the '20s. One main reason is that there is no André Breton here. People do sit and write – stop by The Globe, the crowded émigré bookstore on Janovského 14 in north Prague, and you'll see a full third of the cappuccino-sipping black-clad Prague-lodite customers scribbling busily in their notebooks. There are many American wannabe writers here – even better, they actually manage to publish sometimes – but there is not a Prague literary movement, no Prague literary-isms. No magisterial literary theorists hold forth here as Breton or Louis Aragon or Gertrude Stein did in Paris. There isn't a Prague technique, or a Prague approach, or a Prague literary philosophy that will set a doubting world afire. There are people here sincerely trying to find a voice, but as yet there is no voice. There may well be a new Hemingway here (as *The Prague Post* once declared there must be). But if Prague writers want to do a kind of writing that is really as new and powerful as Hemingway's was in Hemingway's time, then they will have to teach themselves.

What there is, however, is Václav Havel. And that is a great advantage. Václav Havel, the president of the Czech Republic, is a resolutely non-commercial writer. Havel writes three kinds of things: speeches (lots of those lately), moral and philosophical essays (very worthy but a few of 'em go a pretty long way, frankly), and absurdist theater. Havel is not the greatest playwright of the 20th century, but you know, in all honesty, and not just because Havel is sleeping peacefully, a few kilometers away in the Hradčany Castle at the moment that I'm typing this, the guy's plays are not half-bad. I just read them all in translation – it wasn't hard, for there aren't that many – and I enjoyed the heck out of them. All of his plays are clever, some are deep, they are always interestingly structured, and almost all are hilarious. He's without question the funniest head of state in the world.

There will be a meeting of the International PEN Club in Prague next month, and it will be half-again as large as most meetings of this august, world literary body. Havel has issued personal invitations to such luminaries as Aleksandr Solzhenitsyn, Umberto Eco, Harold Pinter, Gabriel García Márquez, Mario Vargas Llosa (who narrowly missed



The Nation of Tourists:

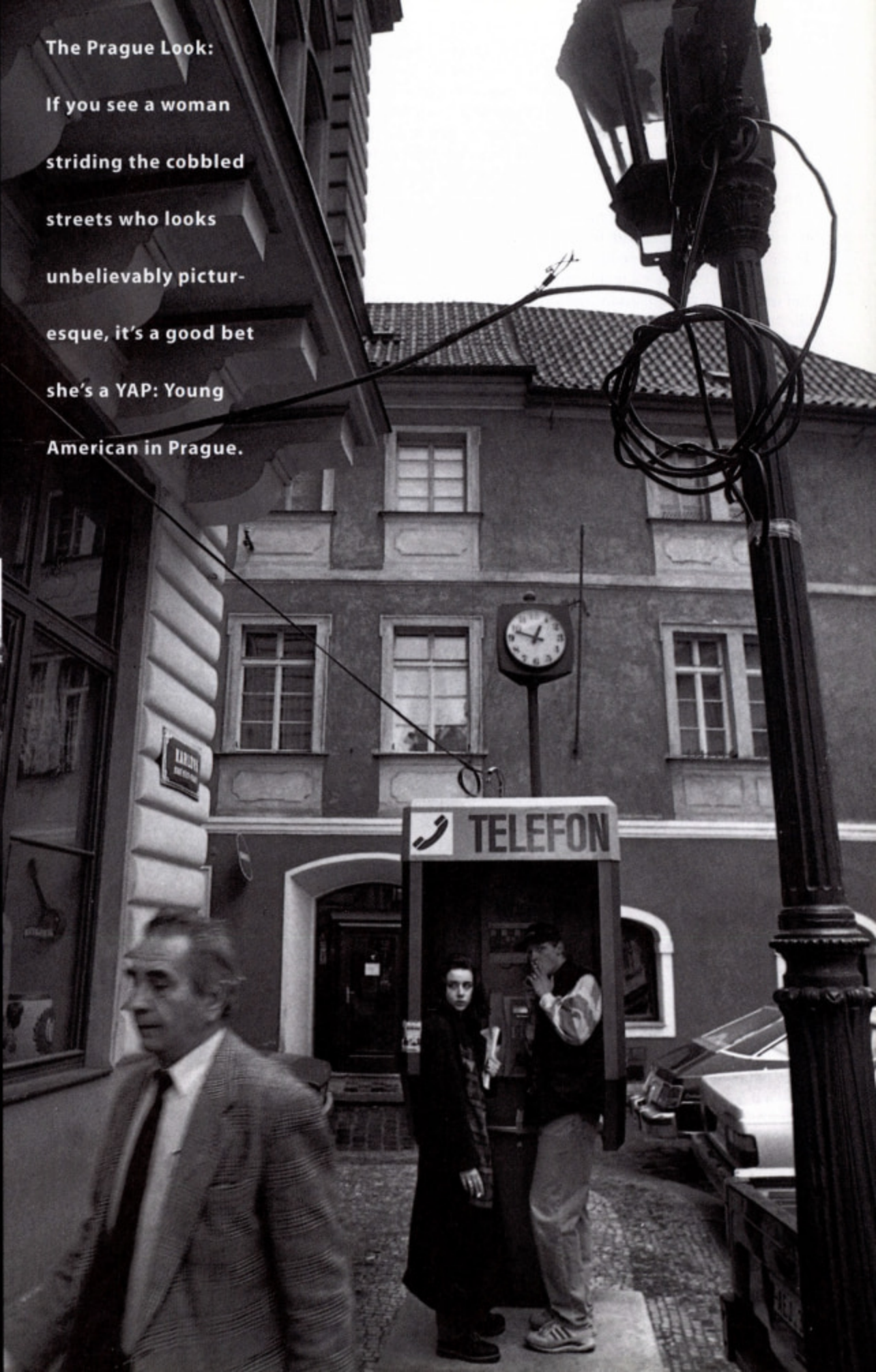
The people of Prague dislodged the Red Army, but are now under occupation by an army of about 80 million tourists a year. Some head for the city center while others check out the Marolda Panorama, the 19th century's precognitive answer to virtual reality.

The Prague Look:

If you see a woman striding the cobbled streets who looks unbelievably picturesque, it's a good bet she's a YAP: Young American in Prague.



Prague is very much like, and unlike, Paris in the '20s. But people do sit and write. Stop by The Globe, a crowded émigré bookstore, and you'll see a full third of the cappuccino-sipping black-clad Praguelodyte customers scribbling busily in their notebooks.



capturing the Peruvian presidency), Kurt Vonnegut, Norman Mailer. You can bet a shiny handful of Czech korunas that all these worthies will strain every sinew to show up in Prague at the polite behest of Saint Václav. If there's any power left in Literature, as a force to move and change the world, Václav Havel is uniquely fitted to mobilize it. A lot of writers come here, not because Havel can teach them how to write, but because Václav Havel is a symbol of what words-in-a-row can do.

That is a very romantic achievement in an almost painfully romantic city, which is trying with increasing restlessness to become rather less romantic. People here like Václav Havel personally. They can scarcely help that. He's a man genuinely guided by principle who is not impossibly self-important and stuffy, an incredible achievement in the 1990s. People know this.

Nevertheless, Václav Havel embarrasses people sometimes. Not every president in the world will hold a formal audience with Pink Floyd, but Havel did just that last week. Havel thought John Lennon was politically important, and was proud to be a personal friend of Frank Zappa. Havel also redesigned the night lighting for Hradčany Castle because he used to be a stage-lighting hand in Prague's little alternative theaters. The Hradčany Castle looks terrific now, tastefully lit in low-key, magic-realist verdigris and salmon pink, but most other presidents don't even know what verdigris and salmon pink are.

Having Havel as president used to be unbelievably thrilling and exotic, but nowadays, as the Czechs knuckle down to the business of renovating their capital and systematically fleecing tourists, Havel seems just a little bit, well, weird.

Havel used the poetry of decency and morality to take power from a numb and corrupted regime, but his formulations have become political catch phrases now. It's "ethical" this and "ethical" that, "moral" the dog and "moral" the cat – and in the meantime, the Czech government is starting to act pretty much like normal governments act, in the usual *Realpolitik* money-and-interest-group fashion. Havel could kick the desiccated guts out of the Communist mummy, but there is scarcely a moralist alive who survives the nerve-shattering grip of postmodern capitalism. Nowadays Havel does a lot of ceremonial ribbon cuttings at bridges, and the country is in the can-do grip of the increasingly determined and autocratic Václav Klaus. If Havel is a world-class dreamer, Klaus is a heavy-duty hustler. And most Czechs today – most Czechs *any* day – would far rather be hustlers than dreamers. Havel speaks and they are deeply moved, and then Klaus says "frog" and they jump.

Havel, despite his worldwide renown, was not the only Czech dissident. Considering the hideous price one had to pay to be a dissident in this country, the former Czechoslovakia had them in abundance. In particular, one dissident group, known as the Plastic People of the Universe, was (or is) probably the heaviest, down-and-dirtiest, most successful rock-and-roll revolutionary force in the world.

When the Plastic People were busted by state security Gestapo in 1976, indignation at this gratuitous breaking-of-butterflies-on-the-wheel led directly to the formation of Charter 77, the dissident group that eventually became Civic Forum, and then, briefly, the revolutionary government of this country. Without the influence of the Plastic People, the flowering of American alternative culture here today would have been impossible.

Those who followed the astonishing career of the Plastic People – "We carried the police around with us like flies," said Plastic Person Vratislav Brabenec – could only conclude that they were either amazingly brave or crazy. In point of fact, as I have recently learned from interviewing local hipster Czechs who ought to know, the Plastic People were both those things. Those courageous Czech hippie revolu-

tionaries were really brave, really Czech, really hippies, really revolutionaries, and really bonkers.

The *éminence grise* of the Plastic People was, or is, a Czech revolutionary philosopher-poet who called himself "Egon Bondy" (Zbyněk Fišer). Egon can be imagined as a kind of Eastern European cross between Kropotkin and Allen Ginsberg, a turbo-Beat Marxist free-love anarchist rant poet. Egon is still alive, 64 years old. He's been so upset by the capitalist turn of events in the Czech Republic that he has emigrated to Slovakia. Egon owns one pair of pants – Czech-made jeans – one dirty jacket, and one battered pair of shoes. Egon has worn this ensemble for years, a declaration of Christ-like ultra-leftist solidarity with the suffering and shirtless of the earth. Here's what Egon had to say about the Velvet Revolution of 1989:

*The new generation is sober in orientation:
the last 40 years don't exist and before us
is a clear and tough future
quite unconnected with anything
It will be – as is already suspected – short
It won't be long before it starts tossing madly
like a tin can on a cat's tail
tied to the shambles of a world divided
between the winners who lost and are
running around searching for their missing victory
and the ones who in the end will foot the bill*

This angry prophecy would be less disturbing if Egon hadn't been proved right earlier, against all the odds. Many people question Egon Bondy's sanity, but I've yet to meet a single one anywhere who questions his integrity.

The Plastic People's formal leader was one "Magor," or Ivan Jirouš. Magor is also a poet who, unlike Egon, could rock and roll. Magor is a living legend and probably the perfect model of a Czech hippie-dissident-tribal-shaman-poet-heavy dude. But *magor* means "madman" in Czech, and his handle was no accident. Magor suffered for years from uncontrollable mood swings, provoking fistfights, drinking binges, and raving in the street. He's a powerful lyricist, a pretty good musician, and a courageous man to whom his country owes a great debt, but he's not what you'd call commander-in-chief material. Magor has been through drugs, booze, rock, jail, police beatings, show trials, the maximum-security prison in Valdice, mysticism, madness, a revolution, and lots and lots and lots of poetry. Magor is kind of kicking back somewhere in the Bohemian countryside these days, and he probably deserves the rest.

Plastic-being Vratislav Brabenec was arrested in 1976; this proved an international embarrassment, so in later years the cops simply pounced on him repeatedly and beat him up in the streets. Brabenec fled the country in 1982 and is now a Greenpeace activist in British Columbia, where he seems to be doing pretty well for himself, although he had to miss a lot of the local fun.

There were others: Svatopluk Kávásek, Pavel Jazíček, many other astoundingly courageous people, a few of them fairly well known to those in the West who followed this sort of thing. In their own country, they were all desperately obscure. An American bohemian-intelligentsia type like Allen Ginsberg was probably 10,000 times better known in America than Magor was ever known in the former Czechoslovakia. To call the Plastic People rock stars is a misnomer, for they were legally denied any right to play music. When the Plastics played, they rocked out privately on homemade speakers and instruments in front of an audience of maybe 50 people who attended in fear for their lives. The Czech regime hated and feared the Czech counterculture with truly hysterical bitterness.

Official reviews of the Plastics' music were less than kind. Here's 154 ▶



Prague's splendid
architecture is
so lovely that it
makes one
conclude, almost
with a sense
of despair, that
everything else
built in this cen-
tury has been
profoundly wrong.
Maybe Prague
really is Second
Chance City.

Marc Porat is CEO of General Magic, a Silicon Valley start-up that is developing new personal communications technologies in alliance with American companies AT&T and Motorola; Japanese giants Sony, Matsushita, and Nippon Telegraph and Telephone; and European powerhouses Philips and France Telecom. *Wired* asked him to describe the larger effects that digital technology — especially General Magic's new "intelligent agent" technology — may have upon the structure and wealth-creating capacity of the overall economy itself.

Wired: When economists talk about the impact of the digital revolution, they usually say it will create jobs and improve productivity. But you say this is much too narrow a way of looking at the economic implications of the technological changes coming.

Porat: Right. What's really at stake, I believe, is the "genetic material" of the economic system itself. Look back at the history of human economic activity. Before barter, people were constrained by their own limited personal resources and had to learn how to supply all their essential needs. The invention of barter, however, enabled them to trade the value of their intellectual content — the skills and knowledge that they put into making goat cheese, for example — for other goods they needed, like olive oil.

Later, the creation of paper money and related systems of accounts made it easier to reach into wider markets. Finally, the invention of capital stock — shares of ownership in factories and other means of

even purchase them and order delivery for me, if I've told it to do so.

The agent never gets bored, never complains. Whatever you or I might want, if it's in the marketplace, the agent will find it. It's a whole new paradigm, called "I want."

Sure, this would be a convenience. But how does that change the nature of the marketplace?

Until now, merchandising has always been organized so that the person who has something to sell floods the market with advertising, promotions, coupons, and so on. But now we can turn that upside down. Now we can say to our agent, "I want a discount coupon for cereal," or "I want the best-priced tuneup for my car." Sellers will see your agent and, noticing that you've raised your hand as an interested buyer, will come to you to try to fill your request.

This has never been done before. There's never been a time in history where the ordinary consumer can put out a request-for-proposal into the market at large and have vendors bid on it. Corporations can do it. Governments can do it. But not consumers.

Why not?

Simple. We've never had the mechanism, the technology, to do it. And think about what it could do for the efficiency of the market.

Today, for example, 320 billion supermarket coupons are printed every year, but only about 8 billion of them are redeemed. What if consumers could use their electronic agents to find discount coupons for cornflakes, pet food, toothpaste, laundry detergent, toilet paper, and all their other necessities without having to spend their lives cut-

(WANT)

Marc Porat and his agents of change. By David Kline

producing goods — helped money flow where it could be best used to create new productive capacity, expand trade, and increase wealth.

Is there some common thread to these changes?

Abstraction is the key. If I have to carry my goat cheese with me and find you carrying your olive oil, the market is slow. It's stilted. The transaction cost of finding you, and arriving at some sort of exchange value is high. But by abstracting our goods into something called gold — and then paper money and a system of accounts — things can now move faster. Trade can move broadly across vast distances.

But, ironically, at the level of everyday consumption, most of us are still limited by physical reality.

How does digital technology change that?

The invention of electronic agents will allow people to abstract their commercial desires from their physical selves — to create representatives of themselves — that go off and do useful things for them in the marketplace, buying and selling goods and services.

This has never happened before. We have always been firmly rooted in ourselves, except for minor exceptions like the ability to call a travel agent or a stockbroker and have that agent do things for us. Until now, only the rich could afford agents. But with digital technology, people will have the ability to create electronic agents for free, essentially — or close to free — to do things for them.

In my case, my kids burn through a pair of Nike shoes every six months, so I'd like to buy them on sale if I can. I'll be able to instruct an agent to sit out there in the electronic market, watching for those shoes to go on sale. When it spots a sale, it'll alert me to that fact, or

ting through newspapers — which is a major roadblock to the efficient use of coupons?

The economic effects could be great. Merchandisers, for example, would not have to suffer the waste and expense of printing and distributing coupons that are redeemed at only a 2-percent rate. And for working Americans, who have an average disposable income, after rents and mortgages, of perhaps US\$500, the ability to easily obtain enough coupons to save an extra \$50 a month, for instance, would mean a 5 percent raise after taxes in their income.

This could turn retailing upside down.

Well, it would be much too simplistic to say that the seller's market will suddenly become a buyer's market. Initially, perhaps only 1 percent of retailing will be done electronically. But over the course of time — and it'll take 30 years, at least, before we really know how to do electronic markets — it will become an increasingly viable form of commerce.

But how will this create more wealth for society?

Same as new technologies have done throughout our history. As digital technology reduces the transaction cost of buyers and sellers finding each other — and of buyers and sellers reaching into more varied markets on a global scale — markets can become vastly more efficient, thereby making available a lot more money that can be put quickly where it'll do some good. ■ ■ ■

David Kline is completing The Living Room Wars: The High Stakes Battle for the Digital Future, a book co-written with Daniel Burstein and set to be published this year by Dutton-Signet.



The Wired Scared

Wired is a future-friendly magazine. We think technology is rapidly opening up possibilities and revolutionizing the old order in a way that gives a chance to smaller players. We are unabashed optimists about our collective opportunities as we round the corner into the next century. We are skeptical of anyone's claims (including our own) to know what the future brings, but we look at the glass and see that it is no longer half-full but brimming over.

So, we are often asked, Is there *anything* you worry about?

There is. A bunch of things, in fact. We call them the *Wired Scared Shitlist*. Ten technological developments that truly give us the creeps: suitcase nukes, plutonium tap water, over-the-counter eugenics, currency collapse, Microsoft victory, electro-cancer, EMP bomb, techno-feudalism, sandlot nuclear war, viral Chernobyl.

The way we figure it, if we, the future-is-friendly experts, are worried about these things, then you'd better get out of the pool now.

We have seen the future,

and it's not just amazing, it's terrifying.

(Happy Fuckin' New Year!)

Los Angeles Times

CIRCULATION

15,000,000 READS DAILY / 25,000,000 SUNDAY

WEDNESDAY, JANUARY 1, 1998

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TIMES SQUARE A-BOM

President Dole Appeals for Calm, Declares Nation

■ 5 million dead, 10 million injured.
Damage is estimated at \$3 trillion.
'Our worst nightmare has been realized.'

WASHINGTON — The President declared a national emergency Tuesday morning after a 10-kiloton nuclear bomb exploded in the heart of Manhattan, transforming Times Square into a yawning crater approximately 500 feet in diameter and 100 feet deep.

"At 1:04 this morning, our most terrifying nightmare was realized," Dole said at a press conference from the White House. "Let me assure all citizens of these United States, indeed, of the world over, that this was an isolated incident perpetrated by an identified terrorist organization."

Dole, who called the 3 a.m. press conference to appeal for calm and an end to spontaneous rioting set off in Los Angeles, Chicago and other U.S. cities, refused to name the responsible organization, but vowed its leaders will be brought to justice. "We have had information in our possession for some time that pointed to this," the President said

when questioned after his statement. He added that the 1993 bombing of the World Trade Towers was "an attack by a similar group."

The bomb leveled 4 square miles on the island of Manhattan. Ground shock pressure destroyed water pipes and killed electricity sources from Hartford, Conn., to Baltimore. Several million people are estimated dead or dying from the blast, and hundreds of thousands are flocking south toward Maryland and north toward Canada.

"This is the gravest test of our national character since World War II," an ashen Dole said at the conference. "New York will rise again," he promised. "We will not buckle to the agents of terror."

Regardless of the President's promise, emergency officials say New York and most of the Eastern seaboard will be contaminated by radioactive fallout for decades. Hiroshima and Nagasaki, both



New York City after terrorists turn Times Square into a smoking crater. Millions are fleeing, more clog the bridges and tunnels heading toward New Jersey, Connecticut and other

Shitlist

Photo illustrations by Eugene Mosier

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THE

VOL. CXXXXCCVII ★★★

For Many Victims of Tokyo Water Poisoning, Suicide Is Best Way Out

Fearing Slow Death
By Radiation Sickness,
Some Turn to Tradition

Choosing an 'Honorable End'

TOKYO, June 20, 2002 — Tokyo resident Yoshi Tamaguchi, 55, usually awakes at 6 a.m., meditates for a half hour, takes a glass of green tea and half an orange as breakfast, then heads for his stressful



but financially rewarding career at Matsushita's corporate headquarters here.

But not today. One week after terrorists slipped a massive dose of high-grade plutonium into Tokyo's sole source of potable water (and Mr. Tamaguchi's green tea), the Matsushita executive decided that he would rather die honorably than slowly. With the help of his family members (who so far have not developed radiation sickness), Mr. Tamaguchi dressed in his family's traditional kimono, uttered his

W

Business and

Businesspeople by the widespread Japanese companies this side of the opportunity in Japan. (Article on Page A)

The failed bid Nabisco by tobacco co/Viacom has, at refusal by Chairman Biondi to accept a offer for Glaxo/Vi B voting shares. (Page B1)

A last gasp effort soft CEO Bill Gates. Id Software's decade-long takeover attempt. (Article on Page B1)

The \$300 million adaptation of Neal Stephenson's sci-fi thriller "The Diamond Age" is set to debut this summer, but Wall Street is wary of its ability to earn back director Jim Cameron's most expensive effort to date.

Hilton-Marriott Hotels said it is considering selling its Disney and Sony entertainment

HotWired: Signal/Latest

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Landmark Case Legalizes Genetic Tampering

Experts fear cults based on eugenics; Genentech, other biotech stocks soar

WASHINGTON, D.C., 4:58 p.m.; Aug. 12, 2002 (via Reuters) — The U.S. Supreme Court ruled today that parents have the constitutional right to alter their children's physical and psychological makeup.

Over the past five years the court has addressed peripheral issues relating to inexpensive genetic eugenics techniques, commonly called "getties," made possible by bioengineering research completed before the turn of the century. The 6-to-3 ruling in *Gereford v. Gereford* follows five recent Supreme Court decisions that have favored the ability of individuals to shape and select their own genes and the genes of their descendants.

The case involves Virginia resident Jason Gereford and his 18-year-old daughter Virginia. Before his daughter's birth, Gereford exposed her to advanced gene therapy aimed at ensuring her resistance to various AIDS viruses, and determining her religious inclinations (monotheistic) and sexual preference

(heterosexual). Such gene therapy is illegal in the state of Virginia but is easily purchased in California, Massachusetts and other states.

The case made national headlines when Virginia claimed she was a lesbian and subsequently filed a \$25 million lawsuit against her father for attempting, in her words, "To play God with my future."

Virginia's father then sued the California-based biotech giant Genentech, whose gene therapeutic kits he purchased and used. His case was settled in an unusual agreement whereby Genentech will pay for Jason Gereford's legal fees against his daughter. Virginia Gereford's unsuccessful case was argued by the American Civil Liberties Union.

"When forced to balance the rights, responsibilities and freedoms of parents with those of the unborn, we had no choice but to follow past decisions, including *Roe v. Wade*," wrote Chief Justice Lance Ito, author of the majority opinion.

In the dissenting opinion of the bench, Justice Clarence Thomas wrote, "These



Click here for video statement from Jason and Margaret Gereford, shown here in an early photo with their children. Plaintiff and daughter Virginia is at far left.

declared "a new day has dawned in the Free World," after U.S. troops reinstated an unsteady peace in the streets of separatist Northern California. (Article on Page A4)

Muslim and Croat forces continued to bombard what remains of the town of Kupres, in a repeat of a bloody standoff that dates from the early 1990s. (Ar-

Special thanks to our Wired Scared Shitlist writers and contributors: John Battelle, Chris Clark, Dave Dix, Kevin Kelly, Jessie Scanlon, Kristin Spence, Gary Wolf, Jon Carroll, Mary Eisenhart, Phil Patton, Louis Rossetto, Mark Stahlman, Bruce Sterling, John Shirley, Michael Schrage.

SUNDAY JULY 4 1999



News of corrupted money files gives new meaning to the term "run on the banks." Bobbies were unable to control mass hooliganism.

Corrupted currency destroys global markets

Radical hacker claims responsibility, Scotland Yard mute

The London Stock Exchange officially closed yesterday after a week of unexplained and dramatic glitches were discovered in the international currency system.

The global turmoil has paralyzed all major exchanges save the Stock Exchange of Singapore, which claims to have foiled the virus with a complex archival system.

According to Scotland Yard financial investigators, a "computer worm" has been corrupting financial data for at least

10 days, if not longer. Banking institutions in North America report that 85 per cent of the

Page 6

- **Statement from US Treasurer**
- **DigiCash founder: This was avoidable**
- **Running on empty: A new black market**

banks in Canada, the US and Mexico claim rogue

corrupted files. A Houston (Texas) Post headline quotes Kim Sacks, president of Dallas Bank, as saying, "This is a global disaster. You can kiss your money good-bye."

The problem is exacerbated by banks' inability to determine whether a file has been corrupted or merely influenced by the normal process of electronic exchange. Insiders who wish to remain anonymous say that the records and back-up tapes in some banks are so mangled it is unlikely

the true data can be recovered at all.

Police have released the contents of an email message sent by a group calling itself "Free the Internet," which claims that the worm was deliberately introduced by hackers disgruntled with corporate ownership of the Net. He said that the worm has been burrowing into financial networks for about three months, and that it was engineered to activate on June 21. He added it was introduced by seeding

approximately 2,000 stolen smart cards. Scotland Yard would neither confirm nor deny this information.

Since e-money standards were established in 1997, the world's business has increasingly been conducted in electronic data. There have been small disruptions in the past, but this is the first serious stoppage of all major transactions.

In a presentation to the US Congress, US Treasury Secretary Nathan Myrthold stated "This is not an

Gates Takes Stock, Then Takes Oath

REDMOND, Wash., Noon; Jan. 20, 2001 (via Microsoft Network) — During swearing-in ceremonies held today on the steps of Whitehouse 97 (formerly Building #9), Microsoft Chairman Bill Gates shocked the business world by announcing a hostile takeover of every company listed on the New York and Nasdaq stock exchanges minutes before taking the oath of office as 44th president of the United States.

"The petty cash drawer was getting kind of full," said President Gates during a virtual news conference held immediately following his combination acceptance speech/product launch ceremonies for Quicken97 as the new standard for the World Bank, the Federal Reserve, the IMF and all transactions at the nation's only retailer, Wal-Mart.

Even though his presidential campaign started as a marketing ploy to draw attention from the ongoing fiasco of Windows 95, Gates won an unprecedented 76 percent of the popular vote, humiliating incumbent Republican Robert Dole and Independent challenger Oliver North.

In an earlier interview, Vice President Trip Hawkins attributed the success of the Windows Everywhere ticket to the benefits of socialized capitalism, enlightened welfare programs such as free NT T-shirts for the homeless, and the fact that President

Ga
bas



The Philadelphia Inquirer

New Jersey Edition

Tuesday, December 13th, 2003

50 cents outside the eight-county Philadelphia metropolitan area

Inquirer uncovers link between cancer, electrical fields Surgeon general resigns over coverup

Leaked survey finds "shocking" correlation between most major cancers and EMF exposure



Study conclusively links turn-of-the-century facial cancers with cellular phone use.

WASHINGTON — A suppressed government study has concluded that even moderate exposure to electromagnetic radiation, the electrical field generated by computer monitors, portable communications devices, power lines and hair dryers, is a direct and indisputable cause of cancers and genetic mutations, the Inquirer has learned.

In a hastily scheduled press conference called yesterday after learning of the Inquirer's intent to publish the study's findings, Surgeon General Dean Edell conceded he sent the findings "back for review." He said it was "important that we be sure about these findings, since they force our entire way of life into question." He

then offered his immediate resignation to the President.

Evidence that continual exposure to electromagnetic fields causes birth defects has been mounting as the generation of children born "in from PCs" has come of age.

But the report, a joint effort of the surgeon general's office and Stanford and Johns Hopkins universities, even further links almost every form of cancer to EMF, which was recently as 1998 was thought to be proven safe in studies commissioned by industry giants Motorola, Sony and Nintendo.

The link between cancer growths and EMF has been mentioned since



Pulse Bomb Paralyzes New York

Looters rampant as darkness falls

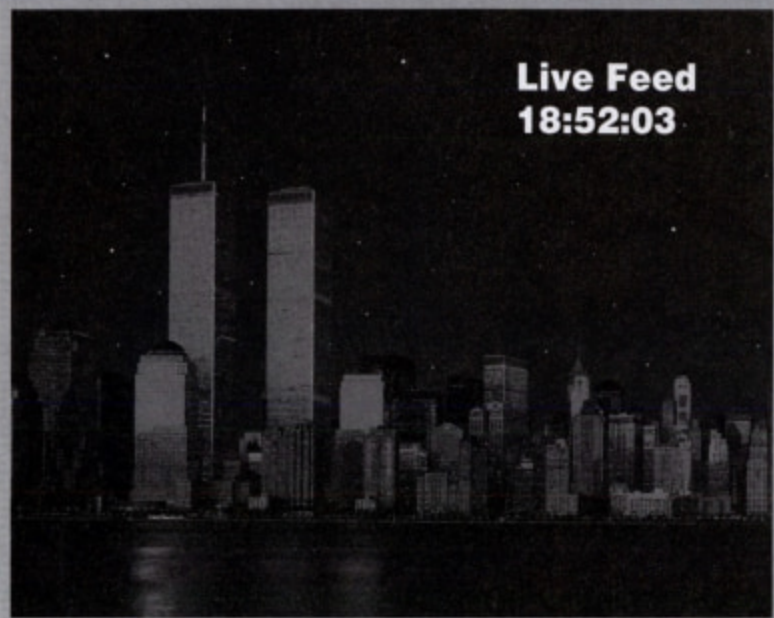
NEW YORK, NY, 6:28 p.m.; June 12, 1997 (via NYT wire services) — Looters and opportunists hold New York City hostage tonight after a massive electromagnetic pulse device was detonated above the island of Manhattan. Christians for the Future of the Past have claimed responsibility for the attack in a video statement condemning the "moral turpitude" of US corporations.

The bomb shocked New York City and outlying areas with an electromagnetic pulse that immediately paralyzed all computers, electronic money networks and telecommunications in the vicinity. Most world markets will close immediately.

While the CFP claimed the 24-hour New York Stock Exchange and other vital corporate networks were the intended target of the attack, electrical grids blanketing the area were also knocked out, causing an immediate blackout and subsequent looting.

"We have struck at the very heart of moral turpitude," CFP spokesperson Jimmy Riggs, patched into the unidentified satellite van. "We can no longer stand for our government allow unmitigated, godless capitalism. Cars, subway trains and elevators in the five boroughs are in complete standstill. As a result, thousands are now stranded in the city which is glowing with looters or caused

Live Feed
18:52:03



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Make the Move to Guardian City

"I was fed up with rampant crime. We all know people who have been victimized by a society

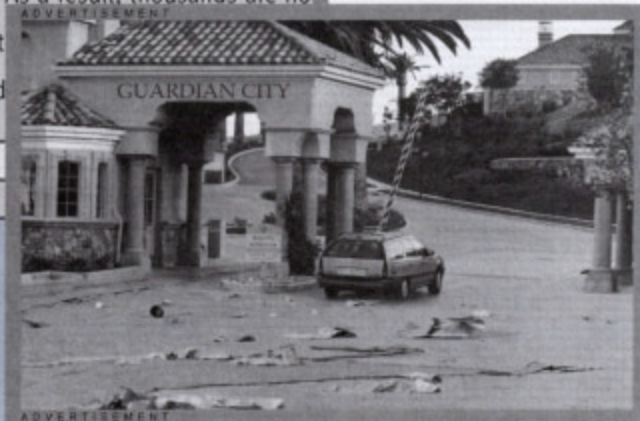
know the government is incapable of stopping the violence. Every day, I saw more outrageous flaunting of the law by international corporations, organized crime, and marauding foreigners. I was desperate.

"So I recently decided to move from my retirement home to Guardian City, a peaceful community of 50,000 like-minded folks. For a monthly condominium fee, each resident of Guardian City receives free escort service to most major shopping and cultural locations. I have an ease of mind knowing an armed force is on duty 24 hours a day to protect our community.

"Add to that 50-foot walls, a top rating by the National Association

of Gated Communities, and the most sophisticated electronic surveillance equipment around, and it's no wonder that levels of violent crime inside Guardian City have returned to those of the suburbs in the early 1990s. Isn't that where *you'd* rather be spending your time? The way I see it, you either live in Guardian City, or you live in terror."

For more information on Guardian Cities around the world, or to get on the waiting list for Guardian City, Los Angeles, call (213) 555-6265, ext. 223



increasingly out of control. I bet you've been a victim, too. You

IMAGES USED IN SEQUENCE: RICHARD LAIRD/FP; LAURA LOU LEVY; SPIKE NANNARELLO/SHOOTING STAR; MOVIE STAR NEWS; RON DAVIS/SHOOTING STAR; MARK LOHMAN/FP; SYGMA; MARTIN ROTKER/PHOTO RESEARCHERS; ROB GAGE/FP; UPI/BETTMANN; LISA QUINDRES/BLACK STAR; WILLIAM FAULKNER; RAFAEL MACIA/PHOTORESEARCHERS; STEPHEN SIMPSON/FP; HEMSEY/LIAISON

Transcript of "Tuned Into America"

Subject: Sandlot nuclear war

November 5, 1997

"Welcome back. You're listening to Tuned Into America. Today's topic: the first use of offensive nuclear weapons since Nagasaki. Should we step in to stop the exchanges between India and Pakistan? Line 1, who are you? Where are you?"

"This is Terry from San Luis Obispo, California. I just wanted to say that I think we should send an aircraft carrier to the Indian Ocean and blow all those cow worshippers to Katmandu."

"No can do, Terry. Whose side are we on? India, Pakistan - they're both supposed to be our friends. And what are we supposed to do to them that they haven't already done to themselves? Line 2, should we get involved?"

"This is Jim from Long Island. I say we send in the Marines and take down India. I just wanted to say I listen to your show every day, and I think you're the best."

"Well, thanks, Jim, but we're not talking love slurps here. We're talking about the first use of thermonuclear devices since the U.S. dropped two big ones on Japan. India fires first, Pakistan responds. Cities in flames. Who's at fault, line 2?"

"I heard India used a nuke on itself to blow up Calcutta."

"Never been proven, but I wouldn't be surprised if they made it look like the Pakistanis did it. Line 3, what's the real story behind this war? Is it land? Or do they just hate each other's guts?"

"Hey, this is Oscar from Duluth. Who knows with these people? They pray to rats and eat dirt for dessert. Let them nuke themselves into oblivion."

"Big problem, Oscar. These people don't make nice, neat nuclear bombs like the good old U.S. government. No, their nukes are what's called 'dirty weapons.' See, the uranium in a Third World nuke usually comes out of some decrepit old Soviet reactor through the Afghan black market. When the Pakistani in a missile and toss it into the back yard of the Taj Mahal, it sp enough radioactive pollution to kill off California. This cloud of crap then starts floating up into the jet stream, and then, who knows, the wind will blow it? Maybe onto your house, Oscar. Line 2, what's next, Pakistan?"

"This is Roger and I'm calling from the great state of North Dakota. Has your side used plague bombs yet?"

"Hello, Earth to Roger, welcome home, spaceboy. The plague's what the whole mess started in the first place. India says Pakistan let loose a bionic variation on the bubonic plague that makes the Black Death from the Middle Ages

NEWS

MESSAGES

MARKETS

SPORTS

Deadly Viral Plague Traced to Switzerland

Link to International Jet Traffic Studied

GENEVA, 8:01 p.m.; Oct. 12, 2008 (via Microsoft Network) - The source of the deadly Ebola 4 epidemic has been traced to a freak accident two years ago in a biotechnology laboratory here, and leading health officials may have linked its spread to international jet travel.

Jean Beaux, head of the EU Health Committee, announced that his organization believes the plague stems from a benign virus that was inadvertently cloned with genes from a strain of Ebola 2 discovered in the 1990s. Perhaps the nastiest viral plague of the late 1990s, Ebola 2 caused its hosts to bleed to death within hours. A cure for this gruesome bacterial infection was developed and later stored in a laboratory run by SwissPharm here.

Two years ago, Beaux noted, a severe fire gutted the SwissPharm lab, where hundreds of viral agents besides Ebola 2 were stored. "The meltdown, the heat and the flooding from firefighting efforts released the Ebola 2," Beaux said, "and probably generated a new strain of the virus borne in both air and water."

Beaux also released a preliminary report on characteristics of the rapidly spreading Ebola 4 virus. According to the report, the virus resides in human bodies for as long as two years before breaking out in a dramatic sour-smelling rash that quickly transforms its host's living flesh to gelatin.

It is not known at this time how many are infected with the virus, and whether everyone infected will develop symptoms. Dr. Elaine Morris, a staff epidemiologist at Harvard University, has suggested that the virus, which requires minimal moisture to survive, lives in the air-conditioning ducts in airplanes. Dr. Kyle Durran, Noble prize-winning biologist, says, "that guess is as good as any other." If the virus does spread by airplane, he estimates that, given the unusually long latency period of the virus, as many as 75 million people could have been exposed to it.



A mortician examines a victim who succumbed. Press here for front view. WARNING: extremely graphic image.

in the last
ay as Chile

Wired: "Mediology" sounds like a mix of media and semiology. What does it really stand for?

Debray: My starting point was a sense of intellectual astonishment at the mysterious fact that certain signs, certain words and images, get transformed into acts. The parables of Jesus of Nazareth, for example, were reworked by St. Paul into a body of beliefs known as Christianity. The writings of Karl Marx were transformed into a far-reaching political program by Lenin. Powerful ideas need intermediaries. Then I began

to realize that these systems of belief – ideologies as we used to call them – are also part and parcel of the material delivery systems by which they are transmitted: if a book like *Das Kapital* had an influence, then it was because the technologies of print, the networks of distribution, and libraries worked together to create a fertile milieu – what I call a "mediosphere" – for its operation.

This fairly modest proposal was aimed against a tradition of viewing ideas as "texts," as pieces of disembodied knowledge analyzed in terms

nations, and laws) and now the recently opened videosphere (audio/video broadcasting, models, individuals, and opinions). This sounds like Marshall McLuhan. How do you relate to the author of *Understanding Media*? McLuhan is obviously a precursor, even though I would qualify him more as a poet than a historian, a master of intellectual collage rather than a systematic analyst. As he himself said, he was an explorer rather than an explainer.

Clearly, my classification resembles his in so far as each historical period is governed by major shifts in the technologies of transmission. But in my view, these apparently different historical stages are more like successive geological strata than quantum shifts from one "medium" to the next. For example, I have written a book examining the history of how people have looked at images: traveling "through" images to God in the age of idols (the "logosphere"), contemplating "beyond" images during the age of art (the "graphosphere"), and now controlling images for their own sake (the very recent "visual" age of the "videosphere").

McLuhan located the primacy of the visual in the age of print, whereas I would say that "seeing" is a constant practice in human history that is differentially influenced by the dominant mediosphere.

I also feel that McLuhan blurred over some fairly complex

Twenty-seven years ago, French radical theoretician Régis Debray was sentenced by a Bolivian military tribunal to 30 years in jail. He had been captured with the guerrilla band led by Ernesto "Che" Guevara, Fidel Castro's legendary lieutenant. Released after three years, largely because of the intervention of compatriots such as President Charles de Gaulle, André Malraux, and Jean-Paul Sartre, Debray returned to writing. (His 1967 *Revolution in the Revolution* is considered a primer for guerrilla insurrec-

In the '60s, Régis Debray fought beside Che Guevara in Bolivia.

Revolution in the Revolution

Today, his obsession isn't ideology– it's "mediology." By Andrew Joscelyne

tion.) He spent five years in the early '80s as a special advisor on Latin American relations to French President François Mitterrand.

Creating a discipline he calls "mediology," Debray has investigated how it is that abstract ideas can end up as world-changing ideologies. Today, he is developing a new theory of the transmission of ideas through history, to grasp how words become flesh, ideas ideologies. *Wired* tracked him down in Paris to find out more about the brave new science of mediology.

I would make an analogy between what I call mediology and the strategy of the neurosciences. While the neurosciences are dedicated to overcoming the inherited duality between mind and brain, mediology tries to view history by hybridizing technology and culture. It focuses on the intersections between technology and intellectual life.

Schematically speaking, you propose three historical ages of transmission technologies: the logosphere (the age of writing, theology, the kingdom, and faith), then the graphosphere (the age of print, political ideologies,

of signs and codes. In the last analysis, you could rephrase what I'm interested in as a black-box problem. If the input is sounds, words, letters, even photons, and the output is legislation, institutions, police forces, and so on, then inside the black box must be what I call "the act of transmission," the whole set of technologies and environments that translate the input into the output.

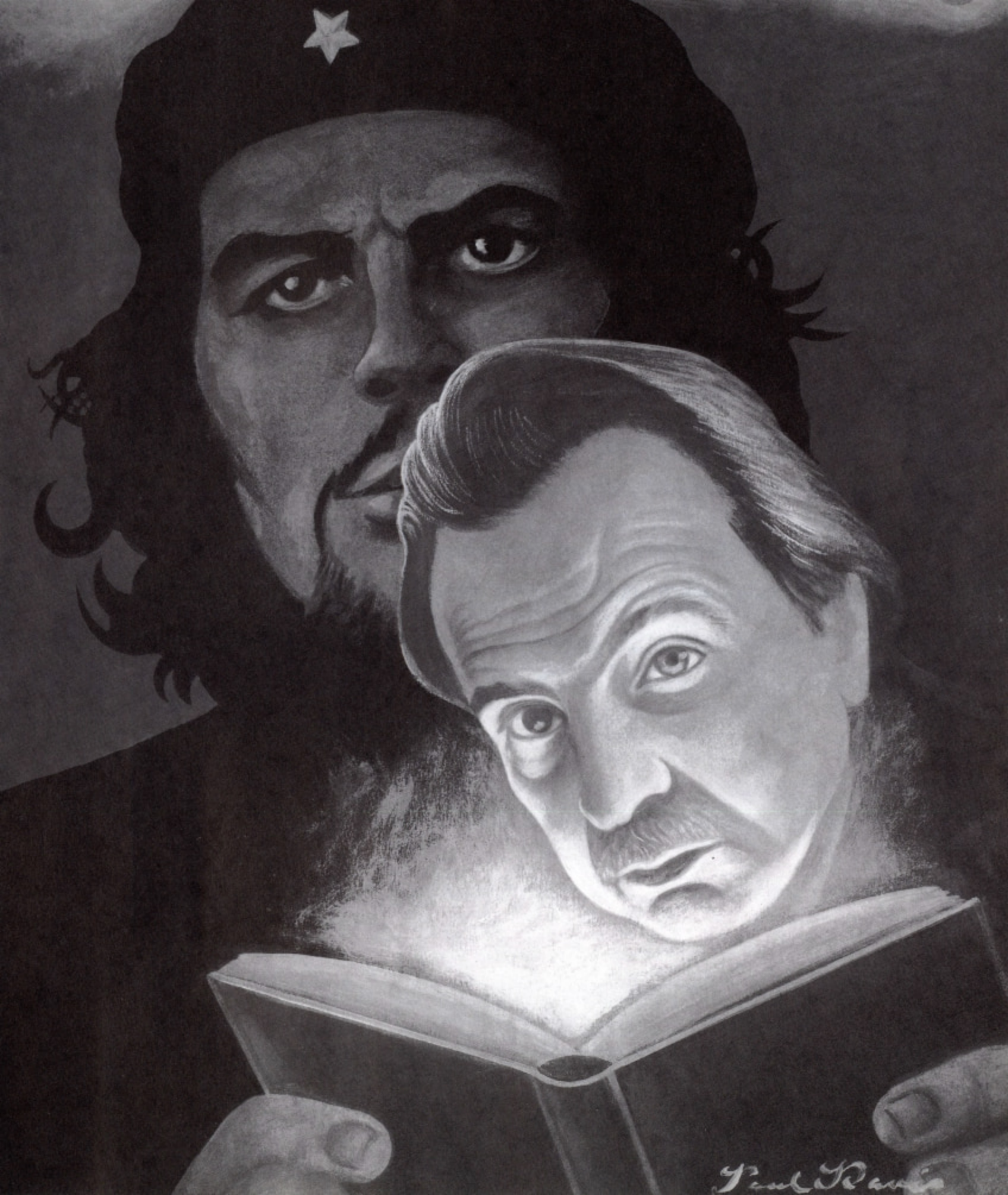
It sounds as if you are trying to smuggle a little hardware into what most people think of as the history of ideas.

issues in his famous "the medium is the message" sound bite. The term "medium" can be unpacked into a channel (i.e., a technology such as film), or a code (such as music or a natural language), or a message (the semantic content of an act of communication such as a promise). By reducing medium to a channel-eye view, McLuhan overemphasizes the technology behind cultural change at the expense of the usage that the messages and codes make of that technology. Semioticians do the opposite – they glorify the code at the expense of what it is really used for in a specific milieu.

Mediology tends to take a very long and very broad view of how technologies might influence the transmission of ideas. What can it tell us about our own preoccupation with the impact of technology today?

Giuseppe Verdi once said, "Looking back at the past is a real sign of progress." In my opinion, futurologists such as Alvin Toffler tend to overemphasize the thread of technological determinism in history and then project it into the future. The technologies of transmission – writing systems, printing presses, and computers – do not necessarily drive change 161 ►

Andrew Joscelyne (100155.1602@compuserve.com) is a Paris-based freelance writer with a special interest in technologies for augmenting intellectual work. He is writing a book on the development of language technology.



T R U C K I N '



Ralph Lowrey, veteran driver, at a truck stop on highway 40 outside Two Guns, Arizona.

Walt Maguire thinks his boss is trying to convert him from a truck driver into a computer jock. Walt and I are sitting in the cab of his truck, chewing the fat at a dusty truck stop overlooking I-15 in Utah.

Todd Lappin (todds1@aol.com) built many plastic model kits of trucks during his adolescence. More recently, he has been working on an anthology of Chinese thought for John Wiley & Sons.

It's 101 degrees outside, but the air conditioning is cranked up so high my teeth are chattering. Walt hardly notices. He's hopping mad, telling me he's proud to be a trucker, even though it hasn't been much fun ever since his boss back in Phoenix installed a computer in his truck two months ago.

"I've always hated computers," Walt fumes. "I don't understand them, and I never intended to operate one. Fifteen years ago, when

It isn't about weed, whites, and wine anymore.

Not when you have information systems masquerading as freight lines.

By Todd Lappin

Photographs by Bill Zemanek



everyone first started talking about computers, I never imagined I'd end up with one inside my truck. But now look at that!"

He points an accusing finger at a laptop-sized keyboard tethered to the dashboard by a rubber umbilical cord. With its modest, four-line LCD display and color-coded keypad, the keyboard looks like a Fisher-Price toy. I ask Walt to show me how it works. He reaches down to pull the keyboard from its mounting bracket, but it's

wedged in pretty tight, stubbornly resisting his effort to pry it loose. "Don't worry," he grins. "I know how to get it out." Walt slides back in the driver's seat, winds up with his accelerator foot, and delivers a swift kick that sends the keyboard flying out of the mounting bracket and bouncing across the floor mats.

The hapless computer lets out a pathetic beep, and Walt's mood suddenly seems to brighten. "I could probably fix that bracket by

softening up the plastic with a cigarette lighter," he admits. "But to tell you the truth, that just wouldn't feel as good."

Out here on the diesel infobahn, the boss always rides shotgun. The biggest names in the trucking industry are installing onboard computers in thousands of their long-distance trucks, and for many truckers, the experience of being out on the road, miles from nowhere, may never be the same again. That's because OmniTRACS

data such as speed and engine rpm, and pinpoint Walt's exact location for the folks back in Phoenix – to within 1,000 feet.

Truck driving has changed a lot since those polyester days when "Convoy" was a Top-40 hit and hordes of Rubber Duck wannabes waited in line at Radio Shack to buy CB radios. But out on the highway it takes a subtle eye to spot the transformation. Interstate trucking was deregulated in 1980, and competition in the industry has



Schneider National Inc. headquarters.

computers like the one in Walt's truck are more than just overgrown calculators. Manufactured and sold by Qualcomm Inc. – the same people who peddle commercial versions of the Eudora e-mail software package – OmniTRACS is a sophisticated, satellite-linked communications device that can send and receive messages anywhere in the US, provide directions by accessing an online database of common destinations, monitor and transmit vehicle performance

been cutthroat ever since. According to Ken Seigel at the American Trucking Associations, of the top 100 trucking companies in 1980, only 15 are left today. And a study conducted by the Teamsters showed that more than 130 major freight carriers went belly up between 1980 and 1993, in the process sending over 150,000 people scurrying to find new jobs.

At the same time, venerable giants like Mason & Dixon Lines, P-I-E

Nationwide, McLean Trucking Co., Branch Motor Express, and St. Johnsbury Trucking Co. were disappearing, computers were proliferating across America. Guided by an old trucker's mantra – "You're not making any money if the rig ain't loaded and the wheels ain't turning" – the gurus of the industry eventually put two and two together to figure out that information management is the key to keeping businesses afloat. That's why more than 90,000 of the

nerve centers that look like Mission Control.

And get this: while untold multitudes of cyberjunkies eagerly await the day when they'll be able to send and receive data anywhere in the country using wireless personal digital assistants, truck drivers have been doing it since the late 1980s.

Still, for many old-school truck drivers like Walt Maguire, the OmniTRACS system represents an Orwellian intrusion into the



1 million trucks crisscrossing the country today now sport small, flying saucer-shaped satellite communications antennae on their roofs – the telltale sign that an OmniTRACS unit is strapped to the dash. Upward of 1.75 million messages a day pass through Qualcomm's network-management center in San Diego. Meanwhile, back at the home offices of dozens of leading trucking companies, cluttered dispatchers booths have been transformed into large-screen

sanctity of a trucker's cab. Some have even taken to nicknaming their onboard computer terminals "Big Brother."

It's pretty easy to understand the sentiment. Cruising down a freeway 2,000 miles from the boss' office, a trucker whose rig has been equipped with an OmniTRACS unit is subject to more on-the-job scrutiny than the average office serf who toils away in a burlap cubicle just a few yards from the supervisor's desk.

But what's really going on here? Is the Qualcomm system part of a diabolical conspiracy to corral America's modern-day cowboys with a digital lasso?

That all depends upon whom you ask.

"Sure, the computer makes it easy for Big Brother to watch you," Ralph Lowrey told me from his perch behind the steering wheel as we rolled down Highway 99 near Fresno, California. "But if you're out here doing your job the way you're supposed to, it shouldn't make much difference who's looking over your shoulder."

Ralph and I were making our way south in the early afternoon sun, hauling 22 tons of powdered lemonade mix to a warehouse in Anaheim, just outside of LA. Anaheim was still six or seven hours away, so for the time being we had nothing to do but drive and get to know one another. Ralph, a muscular, 42-year-old with steely eyes and a broad grin, told me he's been hanging around trucks ever since he was 12, when his daddy taught him how to drive an old Peterbilt the family used to haul hay around their Wisconsin farm. In his late teens, Ralph got to feeling that it was time to see the world, so he packed up and joined the Marines, rising to the rank of sergeant after pulling an 18-month tour of duty in Vietnam. A knee injury halted his military career, and Ralph figured he might as well go back to the trade he'd learned from his dad. He started driving trucks. Ralph can't remember exactly how many trucking companies he's been with over the years, but he puts the number somewhere between 15 and 20. Along the way, he says, he worked for plenty of folks who embodied "every shade of shadiness."

Just north of Bak-ersfield, I asked Ralph what it was like to be a trucker back in the not-so-distant past, before the days of onboard computers and space-age mobile communications. The thing he remembered most was having to phone his dispatcher two or three times a day just to check in, pick up load assignments, and receive the latest pronouncements from the front office. He recalled that the simple task of exchanging these mundane bits of information consumed a lot of time and energy. He estimated that he wasted hours each day parking his truck, searching for pay phones, listening to busy signals, and angrily twiddling his thumbs while on hold. He said it was a big, fat pain in the butt.

"I've never liked talking on the phone," Ralph confessed after taking a swig of coffee from his Thirst Buster travel mug. "If you try to get across all the things you need to say using the telephone, you end up spending a lot of time going nowhere. I hate waiting on hold for 45 minutes just to have a three-minute conversation with my

dispatcher. I'd much rather punch a few buttons to find out what I need to know. That way I can get back out on the road – where I like to be."

Such explanations made it easier to understand why Ralph had wanted to be one of the first in line to get an OmniTRACS unit in his truck when his employer, Schneider National Inc., announced it would begin deploying the system in 1988. Headquartered in Green Bay, Wisconsin, Schneider National operates a fleet of 9,000 pump-kin-orange trucks that the company refers to as "The Orange On-Time Machine." Elsewhere, however, Schneider has been called "an information system masquerading as a trucking line." Essentially, both rubrics describe the same phenomenon.

Throughout the 1980s, while competitors were dropping like flies, Schneider National invested heavily in high-tech information-management systems to squeeze every last penny out of the trucks it operates. When the Qualcomm system came along, Schneider management was quick to realize that extending cyberspace to the interstates would make it possible to keep a finger constantly on the

pulse of its nation-wide fleet. That, in turn, would enable the company to offer demanding customers unprecedented levels of service and on-time reliability. And as an added bonus, surveys of drivers consistently showed that truckers put a real premium on quality-of-life issues, like convenient communications and getting home as often as possible. Thus, the bean-counters hoped, putting an OmniTRACS unit in every truck might also help lower Schneider's driver burnout rate – a painfully expensive



At Schneider, the 55 mph speed limit isn't just the law – it's also company policy. OmniTRACS units, like the one shown above, are wired into the company's fleet of 9,000 trucks to track driving speed, fuel efficiency, and hours driven per day. Bonuses – up to 25 percent of a driver's pay – are linked to driver compliance.

problem that plagues the trucking industry.

Thus far, the figures suggest that the techno-strategy has paid off well. Since Schneider began using the Qualcomm system in 1988, company revenues have more than doubled, reaching US\$1.25 billion in 1993 alone. Today Schneider National is the largest full-truck-load carrier in the land, and its orange trucks are almost as common as Golden Arches along America's highways and byways.

Amazingly, Schneider earned these huge piles of cash by emulating the tortoise rather than the hare. Truckers, traditionally paid by the mile, have assumed since time immemorial that to earn the big bucks they must deliver loads in the shortest amount of time possible. In other words: drive as fast as you can without getting caught.

Schneider National turned that logic on its head by using precision logistics, rather than raw velocity, to win the moneymaking race. At Schneider, the 55 mph speed limit isn't just the law – it's also company policy. By keeping fuel costs down and reducing highway

accidents, Schneider figured out that driving at 55 could be more profitable in the long run. And to underscore the point, the company decided to link driver bonuses – which can add more than 25 percent to a driver's pay – to compliance with a 58 mph limit. The rules of the game are simple: drive at or below 58 mph for 90 percent of the time (drivers are given a 10 percent "overspeed" allowance so they don't have to ride the brakes while going downhill) and bring home a bigger paycheck. Of course, there are no speed traps to avoid or radar guns to detect. As long as the motor is running, the OmniTRACS system will be watching your every move.

Driving at 58 mph may make good business sense, but that still doesn't make it cool. After all, playing cat-and-mouse with Smokey Bear is as much a part of truck-driving culture as diesel engines and country music. At truck stops and rest areas all across the land, Schneider National drivers are the butt of countless jokes simply because they seem to spend much of their time lumbering along in the far-right lane. "I don't see why Schneider needs those damn computers," guffawed one trucker I spoke with in Connecticut. "It seems to me they've got their drivers pretty well programmed."

I repeated the jibe to Ralph Lowrey. He just shook his head. The way he sees it, if going fast means so much to you, that only means you've forgotten the real reason why you're sitting in the driver's seat. Sure, trucking is a way of life, but ultimately it's all about making a living. And if the boss is willing to pay cold cash to have a 40-ton truck driven at the legal speed limit – well, then what's the hurry? Ralph says he'll take it slow. And just for kicks, he'll even turn the 58 mph rule into a "personal best" competition.

He invited me to grab the computer keyboard and punch the blue function key marked "View Status." Instantly, a slew of figures flashed onto the display, bearing witness to Ralph's driving habits throughout this two-week performance period. I began reading off the stats. Ralph had covered 2,651 miles. He had exceeded his engine rpm target only 0.08 percent of the time. His engine idling time was 0.54 percent. (Idling, like speeding, is frowned upon as a waste of fuel.) And his overspeed ratio was a measly 0.59 percent – far below his 10 percent allowance. "Hey, that's good!" Ralph beamed. "I've gotten my overspeed down from 0.63!"

Not all truck drivers are so sporting. Every once in a while, some decide they want to beat the system. Unfortunately, while most truckers know a lot about the nuts and bolts of diesel engines, few have much experience penetrating the mysteries of digital code. As a result, most attempts to hack the Qualcomm system have thus far

focused on the computer's mechanical vulnerabilities, instead of its electronic innards.

To escape from Big Brother's watchful gaze, truckers have tried ripping the cord out of the unit's satellite-communications antenna. Others have blinded the system by covering the antenna with a galvanized metal bucket. Still others have installed burned-out fuses into the computer's power supply and then claimed that the unit "shorted out" inexplicably. One enterprising trucker even invented a device that could override a few of the OmniTRACS system's engine-performance sensors. The gadget, which functioned like a dimmer switch, enabled the driver to dial in any given speed – say, 58 mph – which would then register in the computer's black box regardless of how fast the truck was moving. The trick worked like a charm, apparently, until dispatchers began to notice that performance data from the hacker's truck registered as a flat line for hours on end – perfectly constant speed and perfectly constant engine rpm. Since real-world hills and head winds make such a feat all but impossible, the powers-on-high were tipped off to the scheme. The switch was discovered, and the trucker was fired.

So much for *la résistance*.

Shortly after midnight, Ralph and I arrived in Anaheim and dropped off the trailer load of lemonade mix. After gracefully maneuvering the trailer into a parking space, Ralph used one of the OmniTRACS system's fill-in-the-blank macros, called "canned messages," to tell the folks in Green Bay that the load had arrived at its destination safely – and of course, on time. And with that, he took off his boots, climbed into the bunk in the rear of the cab, and went to sleep.

Bright and early the next morning, Ralph double-checked a message telling him where to find the next load. The instructions were straightforward – pick up trailer number F86795, one of the empty 53-foot trailers parked in the yard at Anaheim, and drive it 70 miles northwest to a warehouse in Oxnard. In Oxnard we were to drop off the empty trailer and pick up a full one, F85281, which was already loaded and ready to go. Included in the message were all the street addresses, freight-bill numbers, special loading instructions, and delivery schedules Ralph would need to get in, get out, and get back on the road as quickly as possible.

The information in these messages emanated from Schneider National's Corporate Business Center, a concrete-and-glass citadel that rises from a moat of employee parking lots and immaculately manicured lawns just southeast of Green Bay's airport. It is a surprisingly anonymous place that, from the outside, betrays few clues of its intimate connection to the trucking industry. There are no 166 ▶



Throughout the 1980s, Schneider invested heavily in high-tech information-management systems that helped turn each of the company's trucks into a node on a nationwide network. While other trucking companies dropped like flies, Schneider began to offer unprecedented levels of service and reliability.

11/6/1994 6:46 pm

Visitor

unknown
sector k

sector k

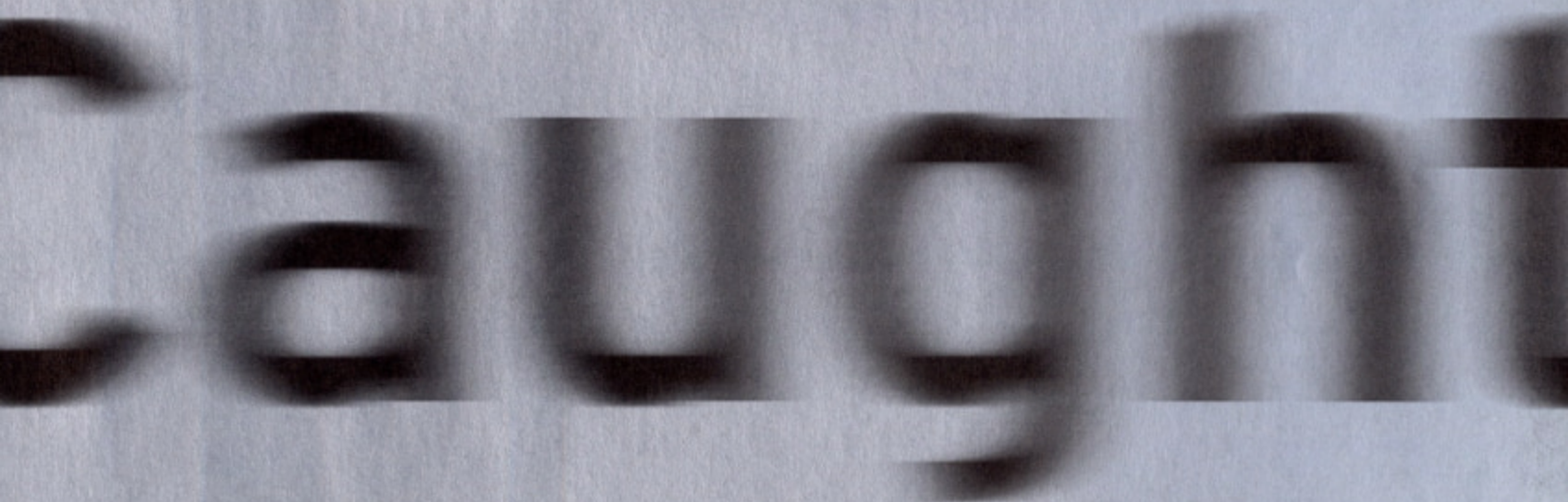
white man
deny access



You used to watch
television.

Now it watches you.

By Phil Patton



It's early morning in the 'burbs. My eyes are barely open, but the video eye is on me. I stop by the convenience store for coffee and newspapers. On the grainy screen of a boxy monitor behind the clerk, I catch a glimpse of a tiny figure that, after a moment, I realize represents me. Opening my wallet reminds me that I'm as short of cash as usual, so I stop at the ATM. Through a one-way mirror, a video camera is recording the transaction.

I drive along New Jersey's Route 5 toward New York City, quite possibly under the video observation of the New Jersey State Police, my state being one of several that have tested remote stations that capture radar-gun readings and license-plate numbers and mail out speeding tickets.

As I descend the dread "helix" into the Lincoln Tunnel, I go on TV for Panasonic. Atop a huge bill-

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board advertising the company's camcorders is the "Panasonic Traffic Cam," an absurdly tiny device that perches like an insect above a sign bearing the face of a white-knuckled driver. The driver looks a bit like the late John Candy – all exasperation as the kids behind him quibble and scream.

I can tune the radio to 1010 WINS to hear what the camera sees: in a cunning marketing tie-in, I get "reports from the Panasonic Traffic Cam high above the helix – there's a 15 minute delay at the Lincoln...."

At the entrance to the tunnel, I pause to pay my toll, beneath cameras to deter toll robbers. Inside the dipping, tiled tube of the tunnel, cameras reside in shells like little jet engines, or maybe like the underwater mini-sub Lloyd Bridges rode in *Sea Hunt*; these protect the lenses from the ravages of diesel dust.

Once in Manhattan, I park in the garage above the Port Authority bus terminal. Here cameras track me to the elevator, down past the magazine stand and the espresso bar.

What do they see?

I remember very specifically when I first began to realize this. It was one night in the summer of 1993, when I was watching CNN. The hypodermic-in-the-Pepsi-can scare was at its height. Dozens of soda cans with syringes in them were showing up around the country. But Pepsi had located a security camera in a Colorado convenience store and caught one of the alleged tamperers red handed – or at least fuzzy-gray handed. From that point on, what seemed an epidemic of tampering was revealed to be an epidemic of copycat fraud.

But what was most astonishing was that Pepsi could manage to call up the incriminating clip out of all the hours of videotape in all the convenience stores across America.

No one can say for sure how many hours the average American is on TV, but according to the Security Industry Association, the US spends about US\$1 billion a year on electronic security-camera systems. We *pay* to watch ourselves. And more and more people are taking notice of this fact. A 1991 survey by the Society for Human Resource Management found that 11 percent of the companies sur-

We all look guilty as hell on black-and-white video; it's a moving mug shot.

I catch one glimpse; beside the escalator is a room, full of some two-dozen video monitors, like a destroyer's bridge, only the guard is bored and dozing. But who watches all the other TVs that watch me, watch you, watch all of us more than we ever realize?

Perhaps not surprisingly, the watchers don't like to talk. The people at the Port Authority of New York and New Jersey are unwilling to show me where they watch me. Another Port Authority property is the World Trade Center, where investigators scoured videotapes from cameras on the tower's parking decks in their attempts to apprehend suspects in the 1993 bombing. Security is a delicate topic with them.

So I head for the International Security Conference & Exposition, the security insider's trade convention, where I'll get a chance to see what's at the other end of the camera for a change.

For a long time now, America has seemed like a country where most people watch television most of the time. But only recently are we beginning to notice that it is also a country where television watches us.

We're all on security cameras, or seccams (pronounced see-cams). At malls, hotels, airports, fast-food restaurants; in offices; on highways; in front of machines – we star in a TV system whose cast dwarfs that of broadcast and cable. In the world of security TV, the equation of home TV is reversed: the audience is small, the programming vast.

veyed used video cameras to monitor workers. And many department stores even use video cameras, set behind one-way mirrors, in changing rooms, beneath signs that vaguely announce "inventory control measures in place."

This has concerned the ACLU and some unions. People should at least know they are on TV, the argument goes. Such a requirement is at the heart of bills now in the US Congress sponsored by Senator Paul Simon of Illinois and Representative Pat Williams of Montana. Smelling business-spoiling regulations, the seccam industry opposes the legislation. The Security Industry Association argues that advertising cameras' placement would make it easier for workers to avoid their scrutiny, easier to pocket parts or secrets, easier to embezzle, easier to do drugs. "A blueprint for criminals," Bill Zalud, the editor of *Security Magazine* called it. "Pro-crime legislation."

But political issues obscure the deeper ways in which video surveillance has changed the texture of our lives, mutated it in subtle ways that only a hidden technology possesses. When black-and-white footage appears on CNN, you know *something is up*. On television, black-and-white video is a visual cue that somebody is about to do something wrong: it signifies a bank heist or a convenience-store job. Even citizen camcorder captures of dramatic scenes, like the Rodney King beating, are in color. Only security systems or the Feds use black and white – witness the Abscam tapes, or John DeLorean's hotel-room wheeling

and dealing. We all look guilty as hell on black-and-white video; it's a moving mug shot. Mother Teresa buying a granola bar at the Gas N Go would appear felonious on such tapes.

But the effects of video style are broader than this: they change the way we imagine ourselves now and the way we record ourselves for history. Every era is characterized by the style of its images. Modern eras are characterized by the style of their moving images. We can never imagine Woodrow Wilson in cinemascope. And in our collective memories, World War I's General Pershing can never move without jerking and snappily saluting. The Kodachromed '50s possess a wholly different feel from the black-and-white, *noir* shadows of the '40s. Now that video cameras feed into little boxes on our Mac or Windows screens, one wonders: will our own era be remembered in the stutter smear of QuickTime in a window, the trembling mumble-typeg of MPEG, once other methods of compression and playback succeed these?

Hollywood, at least, has become aware of the phenomenology of seccams. The films *Sneakers*

Sony Corporation has a new 168-hour VCR. Sanyo Industrial Video Division is proud of its cameras monitoring highways in the state of Florida. Samsung has a new 1/3-inch CCD camera the size of a Mother's Day boutonniere. All the trimmings are here as well: housings and domes and mirrors to hide the cameras, as well as special night-vision devices that automatically snap in place over their lenses when dusk falls, then slide away at dawn.

Amid screens on screens on screens, I encountered the vocabulary of the industry, as stiff and unyielding as the encasements that conceal and protect the cameras: "premises control," "asset retention," and "event-driven monitoring."

This last phrase trips from the tongue of an eager young salesman for the Iowa firm of IMAC, for Integrated Multimedia Access Control Inc. The IMAC program feeds voice, image, and video into a central Windows-based system that replaces the bank of monitors and the dozing guard. The monitor shows a series of views from seccams. In one, labeled "developmental office," a door is menaced by an unsubtle perp wielding a sledgehammer.

Mother Teresa buying a granola bar would appear felonious on such tapes.

and *The Getaway* feature crooks who defeat video security by looping the tape and fiddling with the clock. In *Demolition Man*, video cams monitor sidewalks and streets in the California of the future, though cameras are already scanning key sections of LA freeways to help control traffic. But the ultimate cinematic statement of the dangers of video surveillance is *Sliver*, a nightmare vision of a private individual who has the power to watch us all. The villainy practiced by the William Baldwin slime ball is a twist on the old theme that knowledge is power: its vision is manipulation by video.

Security at the International Security Conference was tight. Business, I had been told by John Galante, executive director for the Security Industry Association, "is under siege from within and without. Thirty percent of all small businesses fail because of employee theft. You've got to watch that cash register." Even the security business, apparently, has to watch its business.

The national gathering takes itself very seriously. This, Galante said, "is the convention they show in Coppola's film *The Conversation*, the one where Gene Hackman walks around looking at the mikes."

All around were cameras and monitors. The comings and goings of conventioners unrolled on computer-screen video at the slightly druggy pace of 15 frames a second, or slower – sometimes just five or two frames a second – serialized microtome slices of reality.

There are familiar names above some booths.

At a convenience store, explains the salesman, the "alarmed event sequence" might run like this: "the door opens, the beer cooler opens, the door closes – the cash register doesn't ring up." Triggered by a pattern suggesting shoplifting, the camera would jump from monitoring two or three frames a second to a full 15. "Intelligent digital video" they call it at IMAC, and it can be operated from anywhere in the world, the cameras aimed with a joystick or mouse and their images fed onto the screen of a laptop.

Most of the vendors here are members of the Security Industry Association. They are still fighting hard against the Simon/Williams bills that would limit the use of video cameras in the workplace. At the convention, the Security Industry Association presents poll results showing that only about 10 percent of people are bothered by surveillance. Most are more concerned about security and welcome the presence of cameras. According to the Security Industry Association, 75 percent of respondents said being monitored made them feel safer. But the poll did not focus on the observations of workers in the workplace, the center of the debate.

The issues of employee surveillance were cast into relief by a New York City robbery at Tiffany & Co., on Fifth Avenue, last September. Police suspected from the start that it was an inside job. The perps took not only a couple million in jewels but also the security-camera videotapes. A 159 ►



Search and Destroy

Inside the metal-jacketed minds of flight-sim heads.

By John Shirley

Photographs by Kathrin Miller

*I am the world's forgotten boy,
the one who searches to destroy....*
— Iggy Pop

You're a thirtysomething guy, you're in the garage untangling the Weber from the fishing gear and your kid's obsolete roller skates, preparing for another in an endless series of backyard barbecues. You're gonna baste; you're gonna spread red sauce on meat.

Suddenly your nostrils flare as you hear the drone of an Air Force jet in the distance. You gaze past your '93 Ford Taurus, out the garage window at a tiny segment of horizon hidden away in the blunt suburban skyline.

The enemy is out there; the kill is waiting.

And you want to be out in the sky, hunting, searching, destroying. You want to bring the meat home dripping red in your grimy, calloused fingers.

Hormones secrete; your eyes dilate; your nostrils flare; the hair on the back of your neck stands up. The Weber drops from your manicured hands with a *clang*, and you run inside to your PC and your flight-sim software.

There's just time for a kill.

You got your five basic flight-sim game packages; you got your low-authenticity simulations like Sega CD's *Tomcat Alley*; you got your PC games like *Blue Max*; you got your network games like Spectrum HoloByte's *MiG-29*, ("Go head to head against *Falcon 3.0* with up to six players!"); you got your special hardware-fetishized, traffic-control-tower-linked miniature amusement parks like *Fightertown*; you got your elaborate online games like *Air Warrior* — which just might be the wave of the future in more ways than one.

The wave rolls like this: Jonathan Baron, like most flight-sim professionals, started as a gamer, a hobbyist. He got involved in helping a new online flight-sim outfit, *Air Warrior*, get off the ground — and he never quite landed. What with work and after-work play, he lives a hell of a lot of his life gunning in online simulations.

He's digitally reliving the good part of World War II, and — What? You doubt there *was* any good part to World War II, aside from liberating the concentration camps? Mostly you're right. But a surviving fighter pilot prefers to think about, say, the one-half of 1 percent of the time he was in the air, when he was in complete command of his machine, when it was an extension of his body, when he was closing in on an enemy in battle (because the enemy's in his sights from above and behind and he *knows* the enemy's going to die and he's going to live). When he wins, he heads triumphantly home, and he feels *good*.

One-half of 1 percent, maybe? But that's all a pilot will want to remember, except for that time he got drunk with the Irish girl, on leave in Belfast, and he banged her in the cemetery on the graves of her ancestors.

That half percent of a fighter pilot's flight time is what most flight-sim junkies are patrolling for, time and time again. Sure there's the

*John Shirley's recent novels include **Wet Bones** and **Eclipse Corona**. His forthcoming story collection is called **The Exploding Heart**.*



*Members of the
510th Tactical
Fighter Wing
(a flight sim
user group)*

fun of the simulation – of taking off and landing skillfully. And it requires skill – the more realistic the game the more skill it requires. And there are male bonding rewards in the process; though, if you're not on a network, some of it is computer-simulated male bonding, complete with voice-overs.

But the bottom line is the kill.

"It could seem unbelievably strange to an outsider," Baron says. "Most of our clients are devotees of a rather esoteric pastime. They're often very, very different kinds of people. But that hunger unites them."

Air Warrior is accessible at 2400 or 9600 baud: up to a hundred people and more around the world can fly together in onscreen flight sim – they're now running a scenario that simulates the 1940 Battle of Britain, with a brain-numbing variety of specialized personnel involved because of the authentically reproduced wide scale of the thing, in its various World War II battle sectors.

Air Warrior has been around since '86, when it was created by Kelson Flinn. Flinn has a PhD in Applied Mathematics, but his heart is in flying over Europe in a Spitfire; he realized his air-combat fetish digitally as vice president of R&D for *Air Warrior's* source company, the Kesmai Corporation, a division, oddly enough, of Rupert Murdoch's News Corporation of America. Robert Shaw wrote the introduction to the manual; Shaw, an active *Air Warrior* player and real-life air-combat vet – and the author of the military press classic *Fighter Combat: Tactics and Maneuvering* – serves as a Kesmai consultant. The fact is, the better flight-sim games, on and offline, are to some extent grounded in real experiences.

Air Warrior is available on GEnie for a mere US\$5 an hour (non-primetime); on Delphi you can play 20 hours for a negligible fee and get a free downloadable version of the software. There's also a retail version, published by Gametek for \$55, which has stand-alone gameplay and modem-to-modem capability. Gametek's CD-ROM version has actual World War II gun camera footage and Spitfire pilot voice-overs. Talk about obsessive authenticity!

Of course, you don't risk death in flight sim. And if you're a pilot – and lots of real pilots get into flight sim – you can use all of those maneuvers you wouldn't dare to use in real flight. You aren't tied to those stale old military forms and training scenarios. You can hot dog like a son of a bitch.

Mostly, flight sim is for men – patient, dogged, persistent men willing to learn, then learn some more; to practice until their wives want to smash their PCs with ball-peen hammers.

Besides all the logging on and background aircraft knowledge and practice with elaborate joysticks (for dogged, persistent men willing to learn, the CH FlightStick is recommended for beginners), the flight-sim flying process requires "threedeer reasoning" – something kids aren't very good at, maybe just for developmental reasons. If you're one of the adults who is good at it, then maybe you're wired into some ancestral skill left over from our hunting and nomadic stage – a skill that helped your ancestors draw a bow-and-arrow bead on a flying goose and then find their way back through the maze of bogs to that comfortable mud hut.

The interest in air combat is particularly strong in Britain and the US. In fact, the breadth and intensity of that interest amazed even a World War II general from the Luftwaffe, Adolf Galland.

Jonathan Baron tells me, "We have a squadron calling in to us from Tokyo and Germany" – to go online with *Air Warrior*. Baron says people telnet in through Delphi, people from all over the world. They're planning regular events pitting one country against another.

Are the Germans flying Junkers, the Japanese flying Zeros, the Americans flying Mustangs against one another, online? Should we be invading Haiti online?

I was a tail gunner on a World War II bomber.

Playing *Air Warrior*: The Battle of the Canal Front, 1942, along the English Channel. I'm in the upper aft turret, tail gunner of a bomber called *Witch's Tit*; the pilot's handle is Hitech. One of the best three pilots online, someone tells me. Our B-25 Mitchell, guarded by Spitfires, is on a bombing run, wreaking havoc on German-occupied French airfields, defended by Focke Wulf 190s. My wife, Micky, is my co-gunner – she's doing the keyboard stuff, turning the turret, using radio; I've got the joystick with its trigger.

The landscape scrolls slowly by in abstract simplicity, the tilt changing with the axis of the plane. The pace seems real enough; it takes a long time to get to the target area, a long time to engage. Then it's all over quickly. Like real life: tedium and then hellish flurry.

I report our heading, reading out from my dials, over the "radio" – typed out messages along the bottom of the screen. On it you hear intermittent banter, bonhomie, advisements; I hit F1 now and then to check the aerial charts and the radarscope. The trip through this virtual landscape is punctuated by the sounds of explosions; the radio reports someone shot down. No action yet for us, though we can see friendly Spitfires (looking like real Spitfires) through the high-rez reproduction of the interior of the turret, each plane seen representing another *Air Warrior* player in some other part of the country, the world. (One guy is playing from Britain.)

Hitech advises me to be watchful now, to be sure to use the icon indicators – red icons moving on the top of the screen for friendlies, blue for enemy – to help me (the amateur) ID bad guys. Don't commit friendly fire. Use the numbers flashing by at the right to show the third dimension, depth, distance in yards. Don't fire till within 600 yards.

Then we're under attack. Very sudden. Blue blips and then the outlines of Focke Wulfs tilting, angling toward us from above. A flash of red light and a thud as we're hit. We're not shot down yet and – Micky turning the turret – I track the sighting brackets over the jiggling, veering shape of the enemy fighter. Difficult to keep it in the sights. Then I fire. Miss. Track again. Fire. Smoke and flame blooms on it – it's going down – but now a bevy of others attack. We're hit, we're hit again. Red flash. Red screen. Fade to black.

We've been shot down. We're back in the "conference room" for the debriefing. We're a dead but chatty bunch of flyers.

And for a dead guy, I'm feeling stoked.

Members of the World War II generation have difficulty suspending their disbelief over games like *Air Warrior*. "Where's my air fuel mixture?" they ask, looking at the simulated cockpits and controls.

Baron wants to "get to the point where you're charging your magnets and you're checking your air-fuel mixture and you're checking your flaps and everything you'd have to do." That seems to be the unspoken motto of the digital gaming industry: make the unreal real. Or anyway, as real as possible.

What'll help, if you're an incipient flight-sim head, is taking the keyboard out of the picture as much as possible and replacing it with joysticks and cockpits. Keyboards take you out of the simulation, see. And you can get just as many cockpit accessories as you can afford. As we'll see, you can get realer and realer. *Air Warrior* has an online training academy – a seven-week course to combat "infant mortality" (newbies getting creamed). Graduates get invited into squadrons, which are fundamental to the game.

Air Warrior was the first flight-sim game to have accelerated stalls, buffeting, blackouts, everything by the book. "We were terrified," Baron says, "because we thought no one would want to go to that much trouble." *Au contraire*: it was a huge success. "People will put up with enormous amounts of agonizing if they believe it's

"We will come more and more to define ourselves as what we can still do that computers can't" – posted on the Net



At FighterTown in Southern California, reality is everything. There's a manly locker room, realistic cockpits, and a control tower worthy of a real airfield.



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The PDA Gets Real ... Close

Neuromancer Speaks!

In the 10 years since the release of William Gibson's cyberpunk classic *Neuromancer*, our perception of how the world operates economically and socially has changed. In addition to adding countless phrases and metaphors to the general vocabulary, the novel served, for many people, as a blueprint for building cyberspace.

The audio version of *Neuromancer*, published by Time Warner AudioBooks, features background music by U2, Argabright, Barg, and Black Rain, and is read by the author himself, whose rhythmic Southern twang leads the listener ominously through



Gibson's audio matrix.

the dead ends of Chiba City to the weightless environs of cyberspace.

The audio *Neuromancer* is a slightly abridged version of the original book, but it remains true to the novel. Gibson's reading lacks the dramatic voice that echoes in my head when I read the book, but the story is so powerful and engrossing that even his monotone delivery is enough to pull me from my easy chair to listen to his tale, to drive across the empty desert landscape.

—Gregory J. Pleshaw

Neuromancer, by William Gibson, cassette tape: US\$23. CD: \$55. Time Warner AudioBooks: (800) 830 8088, +1 (212) 522 8390.

The death of the personal digital assistant (PDA) has been much exaggerated. Even those disgruntled souls who tossed their Newtons and Zoomers in the closet will be thrilled to meet Magic Link, Sony's megacool implementation of the General Magic vision of pocket communications.

Did I say pocket communications? I meant deep pockets, in both the physical and financial sense. At roughly the size of a Tom Clancy paperback, only Captain Kangaroo could slip a Link into his jacket. And at a starting price of US\$1,000 (that quickly rises to \$1,500 with the fairly essential accessories), only the furthest-gone gadget freaks will bite at first. But they will discover something previously unknown in PDA-land— instant use! This sucker is capable of handling appointments, name files, and expense tracking. It can download e-mail, send brief faxes, and even page you when crucial messages arrive in your mailbox.

The secret is that the folks at General Magic, who designed the insides of this Sony box, wisely opted out of the dead-end game of handwriting recognition, opting instead for virtual keyboard and icons of the touch-screen. Once you've input basic facts of your life, simply by clicking on icons, you can, for instance, schedule lunch, and then send a note to a prospective dining partner. With a swipe of the pen, they can accept, and



Beam into the ether with Magic Link, Sony's nifty pocket communicator.

the date is entered into their Link calendar.

General Magic's Magic Cap interface, centered around an animated, cyberspace-office metaphor, has gotten some flak for being too whimsical, but it is unquestionably easy to use. Aficionados are already swapping shareware games. The unit can even change channels on your TV and beam your business card to other Magic Linkers via an infrared port.

But the real power here lies in the built-in communicating language, Telescript, that is compatible with AT&T PersonaLink Services, to which all Linkers subscribe. (Introductory price is \$10/month for unlimited use, with faxes 50 cents per page.) It's easy to dash off e-mail or a fax, and to program agents that will one day perform more complicated tasks.

Alan Kay once called the Macintosh the first personal computer worth criticizing. Magic Link is the PDA equivalent. So here are some criticisms: The screen is dimmer than Dan Quayle and desperately needs backlighting. Fix it, Sony! And, while you're at it, put in more memory—my Link, hungry for RAM, "cleans up" more often than Lady Macbeth.

The second big gripe is cost. At \$200, these things will be irresistible. And the built-in modem, though easy to use, only whets the appetite for a built-in, low-cost cellular phone. When that comes—maybe in '96?—we're in PDA nirvana. —Steven Levy

Magic Link: US\$995. Sony Electronics Inc.: (800) 222 7669, +1 (201) 368 9272.



Hero of the Infobahn

Technology terrorists out to hijack the infobahn are turning New York City upside down. Collectively known as the Silicon Pirates, their agenda is nothing short of Internet anarchy, and only one man stands in their way.

No, this is neither the plot of the latest techno-paranoia page turner nor a state-of-the-art gaming conceit, but rather a surprisingly literate and informed story line in Marvel Comics's *Daredevil*. Complemented by an arresting visual style that's short on



Comics tackle Clipper.

line and heavy on shading, the "Tree of Knowledge" is a five-part miniseries which has been running since March of last year.

"Tree of Knowledge" has everything from a maniacal villain at play in a citywide MUD to a down-on-her-luck actress trying to avoid a fledgling erotica outfit that is trading in cyberporn. It's worth the purchase price just for the spectacle of Captain America philosophizing about the Clipper Chip at an after-hours Wetware rave.

— Todd Krieger

Daredevil: US\$1.50 per comic. Marvel Comics: Available at most comic-book stores.

Unplugged and Online

I gave a pair of Metricom's revolutionary small Ricochet wireless modems the acid test the night they arrived. Putting one on a serial port of our Internet service in place of a dialup modem, I walked down the street about 600 feet to my local hangout, Rogers Bar, plugged the other battery-powered unit into my laptop computer serial port, and *voilà!* I was online, wireless, as fast as the serial port on my laptop could go. If I had high-speed ports, the Ricochet could have sustained 77Kbps throughput — faster than a 56Kbps dedicated circuit.

Metricom's development of a family of wireless modems, which operate in the no-license 902-928 MHz range, are the first real end-user products of their type in the world. In Cupertino, California, Ricochet modems can be rented at a monthly rate of US\$20, with flat-fee service at \$10-\$30 to connect to Metricom's citywide "mesh" of pole-top modems. The result is seamless, wireless Net service. Metricom also sells the Ricochet modems separately at \$495 each.

Ricochets "peer" with other units as pairs or in a local "StarMode" net-



Wireless Net access is no problem with Metricom's Ricochet modems.

work. They even include point-to-point protocol (PPP).

But these are no digital cellular phones. Ricochet's wireless modems operate over "free spectrum": local digital-radio communications set aside by the FCC for low-power devices. If you choose to set up independent Ricochet networks, there is no cost for communications between modems.

Ricochets are tiny to boot — less than 8 inches long, 2 inches wide, and an inch deep. Almost half of the body is taken up by a six-hour battery. In addition, there is a small 9-volt, DC-output wall transformer with typical power plug and 6 feet of cord. And you can order them with either a 9-pin PC or Mac Din serial cable. Plug and play.

With 4-inch omnidirectional rubber-duck antennae, Ricochets have a range of about 1,500 feet. (Limited range is the trade-off for the free spectrum, 1-watt modems.) But if you slap on some Yagi antennae, it is technically possible to give them much greater range. In fact, some 1-watt spread-spectrum setups have operated over 20 miles' line of sight!

I'm thrilled with my Ricochets. They're the technology of freedom.

— Dave Hughes

Metricom Inc.: (800) 556 6123, +1 (408) 399 8200, fax +1 (408) 354 1024, e-mail info@metricom.com.

Sun Box

Seven million Americans work the graveyard shift — hacking on iron at the steel mill, flipping switches at the nuke plant, slinging Slurpies at the 7-Eleven. They're all waging battle against a circadian clock that says, Hey, it's dark. Go to sleep. Night workers are more prone to health and emotional problems as they attempt to stay awake with stimulants or fight after-work insomnia with sleeping pills or alcohol. Relationships are frequent casualties.

Recent studies at the Harvard Medical School have demonstrated that artificial bright light suppresses the secretion of the hormone that researchers believe makes you feel tired at night and thereby fools the brain into thinking it's daylight. Properly timed bursts of bright light can induce a complete adaptation to night work in as little as three days.

The Sun Box Co. of Gaithersburg, Maryland, a



Better than a cup o' joe: this bright light resets the body clock.

pioneer in the field of bright-light therapy, manufactures a line of full-spectrum, non-ultraviolet light products that can be used to reset the body clock. Sun Box products are relatively unobtrusive — or at least as unobtrusive as intense white light can be. They range from a visor with tiny high-intensity lights built in to a 24-by-24-inch light panel. Their best seller is a 24-by-15-inch briefcase-sized desktop unit that's easy to use while reading, typing, or eating.

Park yourself in front of the Sun Box for 15 to 30 minutes before starting a late shift. Read, check in with your favorite alt.newsgroup, or balance your checkbook. You'll feel better and be more productive all night long.

The Sun Box Co.'s products range from US\$349 for the visor unit to \$499 for the large light panel. Some health care plans may cover the cost.

— Dennis McCauley

The Sun Box Co.: (800) 548 3968, +1 (301) 869 5980, fax +1 (301) 977-2281.

Flame Wars

I've learned to be wary of essays about technology by academics. Too often, these scholars are more interested in forcing technology to fit into a pet theory than in helping us understand the complex interplay between technology and society.

Flame Wars, a collection of essays edited by Mark Dery, has all the markings of this genre: it is an expanded edition of the traditionally academic *South Atlantic Quarterly* (Fall 1993) and is subtitled "The Discourse of Cyberculture" (cyber prefixing is always a bad sign). But Dery turns out to be well aware of the dangers of "intellectual carpetbagging," and most of the selected writers have come back from the badlands between technology and



Visions of cyberculture.

society with startling insights.

See, for example, Erik Davis's brilliant essay tracing some of the metaphors that shape how we think about information—from the Gnostics of the 1600s to the fictional worlds of Philip K. Dick and William Gibson. Or read Anne Balsamo's analysis of the myths surrounding feminism and technology.

While there are a few essays that crumble under their postmodern rhetoric, they are rare and easily avoided. This book is crucial reading: it will change how you view the future.

—Steve G. Steinberg

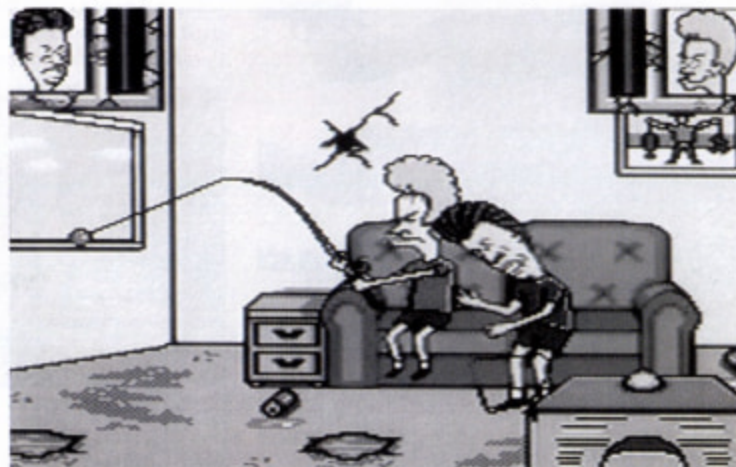
Flame Wars: The Discourse of Cyberculture, edited by Mark Dery, US\$14. Duke University Press: +1 (919) 688 5134.

Fool's Errand

If you can't get enough of the endless loop of *Beavis and Butt-head* reruns on MTV every night, make sure to buy the *Beavis and Butt-head* video-games for Sega Genesis, Super NES, and Sega Game Gear. Each game has a slightly different plot, but the goal for all three is the same. The two want to get their hands on tickets for GWR, the real-life band whose members wear costumes resembling *H.R. Pufnstuf* characters with glandular disorders.

In the Genesis version, the idea is that Beavis and Butt-head's tickets have been shredded by a lawn mower, and they're out to find the pieces. The search takes them to familiar settings such as the mall, Burger World, the high school, and the sewer. Along the way, various weapons, objects, and clues help them fight enemies, avoid hazards, and gather pieces of the tickets.

The game's standard seek-and-find plot keeps you thinking and moving, which is, of course, a major challenge for the two neurally deficient lads. To get a piece of the ticket inside the laundromat, for instance, they



Neurally deficient Beavis and Butt-head fish for GWR tickets.

have to open a squeaky dryer door without waking a woman who'll stab them with a knitting needle. The solution: lube the hinge with some oil from the auto-parts store. But they can't do this until the rent-a-cop lets them in.

The story line is strong enough to keep you interested, but the best reason to play this game is for the laughs. To move around town, our anti-heroes use a TV remote to channel surf from place to place, and instead of the conventional "health" indicators, Beavis and Butt-head have "attention span bars" to show how long they can stay in the game.

Major B&B fans will recognize several characters and situations from the TV show. There are even a few surprises you can't get on TV. One of my favorites is "strategic flatulence," a deadly weapon in the B&B arsenal. So it's gross. It's Beavis and Butt-head. What did you expect?

—John Morkes

Beavis and Butt-head: US\$64.99 for Sega Genesis or Super NES, US\$49.99 for Sega Game Gear. Viacom New Media: (800) 469 2539, +1 (212) 258 6000.

Mamma Roma is on the Loose!

Calling all film buffs! Calling all film buffs! Be on the lookout for *Mamma Roma*, the 1962 drama from iconoclastic Italian auteur Pier Paolo Pasolini. After more than a decade, this cloistered gem is finally being released in the US via Milestone Film & Video Inc. and filmmaker Martin Scorsese.

Mamma Roma is played by the fiery diva Anna Magnani, Oscar-winner for *The Rose Tattoo* and arguably the finest dramatic actress of Italy's post-war cinema. Magnani gives a volcanic performance as a prostitute, whose streetwalking days are over when her pimp gets married to a country girl. With money saved up from during her working years, Mamma Roma opens a vegetable stand in a Roman outdoor market and attempts to orchestrate a respectable life for herself and her teenage son, Ettore, who was raised in the country unaware of his mother's profession. But life deals cruel cards as Ettore falls in with hoodlums and Mamma Roma's ex-pimp returns to reestablish their partnership.



After 23 years under wraps, *Mamma Roma* surfaces stateside.

Declared obscene by local police when premiered at the 1962 Venice International Film Festival, the film (Pasolini's second work following his acclaimed debut production, *Accattone*) was released throughout Europe with various scenes snipped away by bluenose censors. Despite US acclaim for Pasolini's moody and unsettling productions—most notably the neo-realist *The Gospel According to Saint Matthew* and the orgiastic *Salo or the 120 Days of Sodom*—and his cult-like following rising from his sensationalist murder by two street hustlers in 1975, no distributor has ever brought *Mamma Roma* to the US. The film has remained one of the more elusive treasures in the realm of classic celluloid.

Scheduled to make the rounds of the art-house circuit in more than 100 cities, starting with New York's Film Forum on January 18, cinemaniacs can now enjoy their first look at this Roman treasure. Bravo, Pasolini! Brava, Magnani! Ciao, Mamma Roma! —Phil Hall

Mamma Roma, by Pier Paolo Pasolini. Playing in select US theaters nationwide beginning in January.



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Have to pack? Biodegradable packaging peanuts can be found here, along with corrugated fiberboard file-folder boxes, and various recycling waste bins ranging from the 28-quart model to the jumbo 32-gallon round-pail-on-wheels for tossing the junk away.

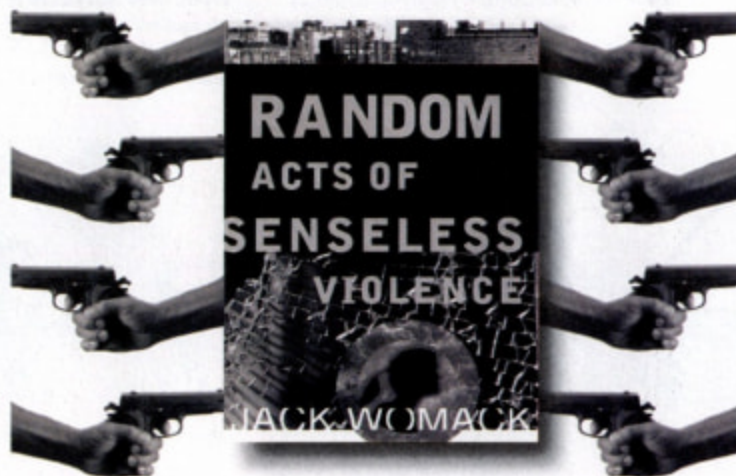
Sure, this helps keep the earth intact for a little longer, but it also keeps your budget off the endangered species list. The negative corporate stereotype of expensive eco-products is nowhere to be seen here. Savings in purchasing and energy are real, offering continued enjoyment the most welcome hue of green imaginable. — Phil Hall

The Recycled Office Co:
(800) 330 7329, +1 (203) 387 9333, fax +1 (203) 389 2814.

Random Acts of Senseless Violence

I used to love reading dark, anti-Utopian books like *We* by Yevgeny Zamyatin or *The Sheep Look Up* by John Brunner; I found a certain pleasure in imagining worlds so much worse than my own. Jack Womack's new novel, *Random Acts of Senseless Violence*, fits squarely in this gloomy genre with its dark portrayal of a just barely pre-apocalyptic New York City. It reminded me of why I used to enjoy these books, and of why I no longer do.

The book is told in diary form by 12-year-old Lola Hart, the precocious daughter of privileged and liberal parents. Set against a backdrop of daily riots, hyperinflation, and mass unemployment, the story traces Lola's abrupt descent from upper-middle class to working poor. As her poverty becomes compounded by a string of tragedies, including her father's death and her desertion by friends, Lola turns increasingly feral and violent.



Womack presents a convincing, but unredeeming tale of a world gone to hell.

Womack is a talented writer. Through subtle changes in the writing style and the use of Lola's argot, he is able to convey the character's transition from a naïve girl to a street-fighting woman. While inventing a futuristic slang has destroyed other books in this genre, Womack's is convincing without being derivative. Womack also has a good feel for extrapolating modern trends (I expect to see the strap-on My Lil Fetus toy he describes in stores any day now).

Yet, there is something patently unchallenging about all of this. To build a convincingly bleak world, he relies too heavily on pushing the usual buttons — wild roving gangs! ineffectual government! As a result, the book often seems mechanical and formulaic.

Random Acts of Senseless Violence is clearly meant to serve as a parable and warning — about politics, about race — but it rarely goes beyond the obvious. It is a compelling and powerful read, but somehow unredeeming. — Steve G. Steinberg

Random Acts of Senseless Violence, by Jack Womack: US\$21. Atlantic Monthly Press:
(800) 788 3123, +1 (510) 658 3453.

The Avid Eater

If you use a Macintosh just to write letters or play *Myst*, US\$9,000 might sound like a lot of money to spend on some peripheral. But this is no squishy Ethernet card or blinky net modem; this is a Media 100 video-editing system. Attaching one to your Quadra 840AV or PowerMac 8100 allows you to capture, edit, and output true BetaCam video — the highest quality video signal out there, period.

Besides the component video, Media 100 allows stereo (16-bit balanced audio). In other words, this is a full-blown nonlinear audio/video editing and composition system, on a Mac, and straight to broadcast, no waiting. If you are able to detect video that has been processed through it, you should be frisked for a personal metering device — there's no apparent loss in video quality. Go ahead, look hard at it — not a dropped frame, not a jitter, not a blocky background in sight.

People wet-nursing new QuickTime edit "suites" have become keenly aware of how neat this trick really is. You can credit Data Translation's very efficient home-brewed video Codec's (Compression/Decompression) algorithms for its quality edge and



No Hyundai: Media 100 delivers serious video at a killer price.

deft handling of the audio/video data pipeline.

Not only does the Media 100 kick performance butt, it looks dead serious. Check out the external breakout box that connects between the Mac and your audio/video equipment — it's as heavy as a cinder block and probably harder to damage. And of course, it's rack-mountable, giving it that sexy lab look. The gray sheetmetal rack mount also features a pair of three-pronged balanced audio in/outputs that firmly state your pro audio intentions before you even power up the Mac. A couple of other inputs allow less endowed videomakers to use their prosumer and otherwise lame S-Video and composite video camcorders (as if!).

So if the quality, speed, and design still don't impress you (not to mention that Data Translation is situated in the same town as Frito-Lay Inc., the makers of SmartFood Popcorn), you might just talk to any sweating video-studio president, who, less than two years ago, spent \$100,000 for a standard-issue Avid Media Composer that has less quality, control, and speed than the Media 100. And you thought Hyundais had bad resale value. — Kennedy Grey

Media 100: US\$8,995. Data Translation: +1 (508) 460 1600 ext. 100, fax +1 (508) 481 8627.



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Man...or Astroman?

Destroy All Astromen!

Estrus

Access Code 1237

They came from a planet of vast oceans, where surf music was the only music – where Dick Dale was god and folk were judged by the size of their whammy bars. But during a galaxy-wide tour, *Man...or Astroman?* crashed in Auburn, Alabama. The group's equipment and means for return were destroyed. Landlocked and penniless (the seashells used for trade back home were useful only at tacky tourist shops), the Astros – Star Crunch, Coco the Electronic Monkey Wizard, Dr. Deleto, and Birdstuff – did what any good assimilating aliens would do: they headed for the pawn shop, bought new instruments, and began to play.

The fi isn't the hi-est, but it's the very charm of *Destroy All Astromen!* This second LP by *Man...or*



Astroman? packs 21 surf tunes (23 if you buy vinyl) with plenty of boom-boom-baap-baap drums and twisted guitar chords. Cue it up to hark back to a time when Sean Connery's Bond was still kicking bad guys' asses, and people called cocktails "high-balls" without a trace of irony. Dig "Popcorn Crabula," "Bermuda Triangle Shorts," and a cover of Dale's "Taco Wagon." Rejoice in the liquid tones of "Mystery Science Theatre 3000 Love Theme." Groove to the cheesy organ that powers "Landlocked." Check out the hip mystery track that follows their cover of "Time Bomb" by Avengers VI.

Destroy stitches its songs with thread from B- and monster-movie soundtracks, providing a delightful element of earthly kitsch to the band's alien sounds. Live, the Astros's multimedia stage-show, which includes an occasional Ventures tune for credibility, is just as gizmo-laced. If you're lucky, you might get to wear the one item salvaged from its crash: the Special Guest Space Helmet. – Colin Berry

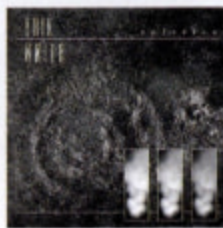
Alvin Curran

Songs and Views of the Magnetic Garden
Catalyst

Access Code 1238

This first US release of Curran's haunting *Garden* blends natural and synthesized sounds into a mysterious environment of rare colors and forms. Sound sources range from the simplest to some of the highest-tech available in the mid-'70s (when the piece was first recorded). Real-world sounds are woven together with the tones of glass chimes, synthesizers, kalimba, ring modulator, and percussion instruments. This could easily be the soundtrack for a Max Ernst landscape.

– Richard Kadrey



Erik Wollo

Solstice
Eurock Records
Access Code 1241

Too many dilettantes with electronics, an overblown sense of grandiosity, and no musical vision have given New Age music a bad name. *Solstice* distances itself from the pack with its gorgeous sonorities and moving musical content. Wollo is a Norwegian guitarist, keyboardist, and composer whose sound is the analog to crisp Nordic air, yet it can also evoke warmer soundscapes. The various icy and steamy synthesized timbres, minimalist repetitive techniques, and strong ethnic (African and Middle Eastern), percussive overtones come together in a music that is rich, sensuous, and inviting. – Dean Suzuki

Heinrich von Biber

Harmonia Artificialis-Ariosa
The Purcell Quartet
Chandos/Chaconne Records

Heinrich von Biber was perhaps the most accomplished violin virtuoso of the 17th century. Here, seven partitas for two violins or violas and bass employ a technique called "scordatura," in which the instruments' strings are deliberately mistuned according to the needs of each piece. This results in a more resonant sound and enables the musician to play two or more notes simultaneously. The members of England's Purcell Quartet play this unusual music with skill and exuberance.

– Bryan Higgins



Mose Se "Fan Fan"

Belle Epoque
RetroAfric
Access Code 1242

RetroAfric scores again with a collection of rare tracks by Fan Fan, one of Africa's leading guitarists. After cutting his teeth with OK Jazz in Zaire, he traveled through Zambia to Tanzania. There he joined forces with the great Remi Ongala in Orchestre Makassy before moving to Kenya and founding Somo Somo. This 60-minute, up-tempo collection samples the many hits that flowed from these groupings, offering catchy melodies, dancing hi-hat cymbals, brassy punctuation, and long, stinging guitar jams. Fan Fan exports the roots of the pan-African pop sound.

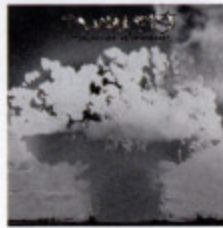
– Dr. Rhythm

Various Artists

Black Box
Wax Trax!
Access Code 1239

The definitive guide to the second wave of industrial music, this three-disc set affords you ample time (218 minutes, actually) to let your mind wander. In the limited edition, a black mesh bag surrounds the steel box, which in turn encases a delightful rarity from Divine's "Born to be Cheap" and Coil's William Blake rip, "Love's Secret Domain." If you've only indulged in the fatuous, juvenile ranting of Nine Inch Nails et al., you should tarry here – at the second wave.

– Rita Johnson



Various Artists

Delusions of Grandeur
Hardkiss
Culled from the singles and unreleased catalogs of San Francisco's Hardkiss – the royal family of American experimental electronic pop music – *Delusions* puts forth a soundtrack for MIDI sex in outer space. The Hardkiss output has been limited to vinyl until now, so *Delusions* arrives as a blessing to those of us without turntables. Hardkiss breaks the structures of house, ambient, and dub, here providing a deep look into the soul of progressive electronic music via a double-disc set. The radical innovation and raw sonic power make it difficult to ignore. – Scott Taves

Don Cherry

Dona Nostra
ECM
Access Code 1240

Trumpeter Don Cherry has internalized the impulsive, harmolodic lessons of one-time bandmate Ornette Coleman. He craves consonance over dissonance, playing here with an empathic group that delivers intensely emotional experiences. Intimate conversations evolve spontaneously from the sextet, goaded by sparse piano, free-associating acoustic bass, and tasteful splashes of percussion. Few songs adhere to strict meter. Cherry's candidly expressive trumpet will recall Miles Davis's expressive days.

– James Rozzi



X-Tal

Mayday
Rough Trade Records GmbH
Access Code 1243

Nobody's plaything, X-Tal offers a spirited new album that features everything from standard instruments to a pump organ and a broken coffee cup. The pop-explosion opener provides a euphoric first encounter; moments later, your mind wanders through haunting, breathy Poe-esque ballads of mental escape; screechy, scratchy songs of political foes and follies; and finally comes to rest on wily comical insights. The band adds a sweet, slightly twisted rendition of "The Look of Love" by Burt Bacharach and Hal David, but only after it rips apart The Fall's "Frightened." Pure poignancy. – Kristy O'Rell

Microwave O' The Month



Vanilla Ice

Mind Blowin
SBK/EMG

Here's a guy so lame he thinks smoking pot makes him cool. Not even drugs can save this poseur from his lack of personality and plausibility. What's next? *Vanilla Ice: The Heroin Sessions*? I wouldn't put it past him. — Justin Hall

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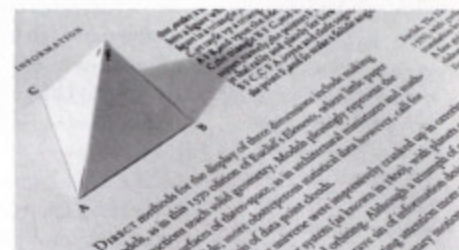
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Code	Artist and Title
1237	Man...or Astroman?, <i>Destroy All Astromen!</i>
1238	Alvin Curran, <i>Songs and Views of the Magnetic Garden</i>
1239	Various Artists, <i>Black Box</i>
1240	Don Cherry, <i>Dona Nostra</i>
1241	Erik Wollo, <i>Solstice</i>
1242	Mose Se "Fan Fan," <i>Belle Epoque</i>
1243	X-Tal, <i>Mayday</i>

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Future Quest: Like Smoking Oregon

I remember many nights hanging out with friends in high school, smoking pot, and saying stuff like "Whoa, wouldn't it be trippy to float in space." It was entertaining then, but discussions followed a predictable path of drug-induced cosmic philosophizing that were resolved only by the decision to drop the topic and search for food.

Those empty conversations came to mind while watching *Future Quest*, a weekly PBS science and technology series hosted by actor Jeff Goldblum. Each episode focuses on a particular topic (virtual reality, space travel) and "explores the intersection of ideas as they



Surf past this series.

surface in pop culture and scientific research." The producers must believe science alone can't hold people's attention, so they throw in MTV-style editing, gratuitous computer graphics, and a few really bad stand-up comics. But interspersing clips of artificial intelligence guru Marvin Minsky and comic Paula Poundstone musing on the future doesn't provide much entertainment or enlightenment. In fact, it's an insult to my (and Minsky's) intelligence. This show has the same content as late-night pot sessions, but none of the amusement value.

— Steve G. Steinberg
Future Quest: Mondays at 8 p.m. on PBS.

Script-O-Rama

Dramatica is a program designed to be a "creative partner" for screenwriters, playwrights, novelists, and short-story authors. As a poor soul doomed to earn his keep as a screenwriter, I was intrigued. Visions of *Dramatica* interacting with my PowerBook and creating big-buck scripts while I sat back doing *The New York Times* crossword puzzle filled my head. Not surprisingly, *Dramatica* required a bit more involvement on my part.

The useful, somewhat complicated program forces writers to make critical decisions regarding characters, plot, theme, genre, and just about everything else you have to think of to make a successful film. The program is long and complex — sometimes I felt needlessly so — but it does make you define what it is you want to say, and in the end, I think it will result in better stories and perhaps even better movies.

The kind souls at Screenplay Systems had their staff members game out one of the movies I'd worked on, *Revenge of the Nerds*. The results were interesting, and for the most part made sense, but I wanted to try this baby myself. I had an idea for a feature that I was about to pitch to a producer.



Dramatica: a creative partner for aspiring writers with time on their hands.

Why not pitch it to *Dramatica*?

I began feeding answers to the various queries the program gave me. It seemed at first that *Dramatica* was somewhat daunting in its demands. The questions it asked seemed at times to be irrelevant, then redundant. Just as I was losing patience, a funny thing happened. I realized that the sneaky little bugger was making me clarify my story! Not only that, but the story was getting better!

Two days later, I had my pitch meeting with a producer, a man who had once been the head of a major studio. The pitch went very well. But the amazing thing was that afterward, when he began asking me questions about the story and the character, it was a piece of cake compared to *Dramatica*. Everything he wanted to know I'd been forced to game out with my ol' friend Mr. *Dramatica*.

The program may not be for everyone. It's tough, time-consuming, and exacting. But if you're willing to do the work, answer its questions, and pay attention to its instructions, the program will make your job as a writer not only easier, but more fun. By the way, I got the deal.

— David Obst

Dramatica, for Macintosh and Windows: US\$399. Screenplay Systems: (800) 847 8679, +1 (818) 843 6557, fax: +1 (818) 843 8364.

The Analog Frontier Foundation

Montana icon Charles M. Russell (1864-1926) is rightly celebrated as the finest painter ever to capture the Wild West on canvas. Yet Russell's artistry with words via newspaper columns and short-story collections has seeped into the crevices of obscurity. Now, the ironically titled Last Chance Recordings has resurrected the last Russell stories in a cassette — *Charlie Russell's Old Montana Yarns*. The effect is no less dramatic than a twilight thunderstorm in Big Sky country.

Brilliantly performed by Montana historian and actor Raphael Cristy, *Old Montana Yarns* depicts a Western frontier quite different from both the white hat/black hat foolishness of Hollywood's B-movie vision and the belated multicultural fantasy world filmed today. In Russell's on-site observations, this is a land full of real people with real (and often surreal) problems. It's not uncommon for a "cow puncher to fall from his horse" in the midst of a buffalo stampede and run for his life, nor is it considered unusual when an ex-boxer is hired as a teacher to tame a feral elementary school class. Dreams — both the closed-eye version (a herder slumbers among his cattle and wakes in a very strange place) and the



Charlie Russell's Montana is a real, and often surreal, land.

open-eyed version (a range robber goes big city and loses it all) — are frequently dashed, while heroism, like the terrified hunter Dunc McDonald holding a buffalo by the tail, comes as an afterthought.

This was a West where the rules were improvised or jettisoned and, not unlike the besieged Daffy Duck in the classic cartoon *Duck Amuck*, the inhabitants of this era reacted quickly, shifting indignities and inanities without going loco in the process.

"Bill's Shelby Hotel," perhaps the craziest of the 12 stories, portrays a rail-riding hobo ascending from lawmen's nemesis to hotel entrepreneur, with nary a pause for introspective wonder. "Whiskey," the ultimate wordplay ramble through emotions and changing times, features Russell's sarcastic commentary on the lunatic effect of frontier booze. "The Trail of Reel Foot" finds a band of Oglala Sioux baffled by curious tracks, unaware of the condition of the hunter who left them.

Often hilarious and occasionally bittersweet, *Old Montana Yarns* is the ultimate sleeper. And at US\$10, it's a steal that even a claim jumper would grab.

— Phil Hall

Charlie Russell's Old Montana Yarns: US\$10. Last Chance Recordings: (800) 484 9684 ext. 2884, +1 (406) 442 2884, fax +1 (406) 449 8729.

Rasterbaters Rejoice!

As producer of a floppyzine with lots of graphics, I'm always looking for a new way to bully pixels around. My favorite image-editing tool comes from Alien Skin Software. Its Black Box disk is a collection of six software plug-ins: Drop Shadow, Glass, Glow, HSB Noise, Swirl, and The Boss. Each performs what you'd expect from its name (The Boss is a sophisticated embossing tool).

Most of the plug-ins duplicate Adobe Photoshop "channel operations" or "chops," which are normally time- and RAM-consuming processes. These tools are not limited to Photoshop, however.



A Black Box of tricks.

er. You can use them with Fractal Design Painter, Pixel-Paint Pro, and ColorIt! for the Mac and Micrografx Picture Publisher for Windows.

Alien Skin makes sure there is plenty of variability for each plug-in, via sets of slider bars that control things like opacity and blur. The simple accompanying manual offers many useful and easy-to-understand examples of how to use The Black Box. I wouldn't have known what to do with the amazing "refraction" feature of the Glass plug-in otherwise.

— Dan Sisko

The Black Box for Macintosh /Power Macintosh and Windows: US\$89. Alien Skin Software: +1 (919) 832 4124, fax +1 (919) 832 4065, e-mail alienskin@aol.com.

It's a Weird World After All

If you need to be reminded that the world is a weird place, tune in to one of those dead-of-night advertorials with studio audiences going ape over spray paint for bald spots. Then again, if you need to be reminded that the world is a really, really weird place, buy the *Fortean Times*.

FT, "the journal of strange phenomena," is a bimonthly British publication from John Brown Publishing that humorously and critically examines such topics as spontaneous human combustion, mysterious crop circles, alien abductions, cattle mutilations, Bigfoot/Loch Ness monster sightings, and science hoaxes. Any "curioiddity" will do; editors Paul Sieveking and Bob Rickard also consider it their duty to tell you about the woman whose behind was scratched by a squirrel as she sat down on her own toilet. (The furry fella had apparently entered the plumbing system via a roof vent. It drowned when she slammed down the lid.) *FT*'s wry, tongue-in-cheek wit is one of ever-so-delicate amusement rather than flip crudity.



Alien abductions, human combustion, and more – in every bizarre issue.

Still, the mag is not for the squeamish. It recently showed a photo of John Bobbitt's severed member, as well as scene-of-the-accident pictures of people believed by some to have died when their midribs spontaneously combusted.

FT, which frequently publishes a "strangeness index" that seeks to prove the world is getting weirder, owes its name to researcher and writer Charles Fort. This American of Dutch stock, who coined the term "teleportation," believed that scientists too often argue according to their own beliefs rather than the rules of evidence, and that inconvenient data is frequently ignored, suppressed, or discredited.

Fort died in 1932, but his spirit lives on in what is possibly the most entertaining publication on the planet. Pick up a copy for a measly five bucks, and prepare to spend many hours ts-k-tsking, laughing hysterically, and elbowing your loved ones while exclaiming: "Hey! Read this one!"

— Rogier van Bakel

Fortean Times: US\$4.95 per issue. One-year subscription: US\$30. Fenner, Reed and Jackson: +1 (516) 627 3836.

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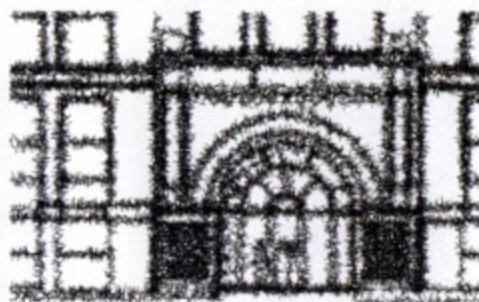
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Palsy for Your Printer

Once upon a time, computers brought order and precision to our designs, making our lines straighter and our circles rounder. But our drawings became a little colder.

Squiggle is a program for architects and designers who want to reintroduce a looser, more energetic look to their computer-generated presentations. This add-on for AutoCAD and other CAD products makes mechanical and architectural drawings look squiggly. Or fuzzy, shaky, steady, or wavy. It's up to you. By randomly tweaking the data file that usually specifies straight lines and curves, *Squiggle* can make the final output look like a carefully hand-drawn sketch or, if you prefer, like something quickly



Make expensive computer designs look like napkin sketches.

blocked out on a napkin.

The weight, zig-zag, and waviness of the lines varies with the style of "squiggling" the user selects. "Napkin" style uses short, bold strokes, while "sketch" features tighter, more careful lines that start and end with loops in the style of traditional drafters. There are seven preset squiggle settings and a customizing function that lets users adjust the amount of squiggle.

There's a price to pay, however, beyond the US\$99 it costs to buy *Squiggle*. The program adds about five minutes to the typical plot time, and your hard drive's going to take a hit as well: the output files can be anywhere from two to seven times the size of the original. — James Denning

Squiggle for DOS or Windows: US\$99. The Premisys Corp.: (800) 878 7736, +1 (312) 828 0034, fax +1 (312) 828 0096.



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1. Young multimedia stars

After reading the 100th media hymn to these Renaissance geniuses, I began to believe we live in a country where every multimedia developer is young and shockingly hip. Between surfing Bali, lunching Hollywood, and modeling Gaultier, they find time to almost single-handedly create not only a revolutionary art form, but a billion-dollar industry. However, some astute research revealed that the key industry figures are old and graying and, in fact, only the programmers Net surf.

2. Videophones

The videophone is a shining example of technology hype. It was invented for the sole purpose of showing off a clever design concept. Despite repeated failures over the last 25 years, despite convincing sociological reasons why no one wants a videophone, engineers continue to develop new, improved versions. Two research fronts exist today: In the US, computer companies such as AT&T, Intel, and Sun are developing hardware that allows standard computers to be used as videophones. And in Japan, consumer giants like Sharp and Hitachi are testing devices that allow camcorders to deliver images over a phone line. The technological achievements coming out of both camps are impressive – but misguided.

	Current Position	Position Last Month	Months on List
Young multimedia stars	1	–	1
Videophones	2	–	1
Death of online services	3	–	1
Return of VR	4	1	3
Robotics	5	4	2



3. Death of online services

The history of US technology is the history of a recurring US dream: new inventions will empower the individual more than the corporation. Despite numerous events to disprove it, the dream has not died. A current variant is the prediction that the anarchic Internet will turn people into media makers and kill off more restrictive commercial services like America Online and CompuServe. This prediction has two flaws. First, in a society satisfied by Baywatch reruns, few people will produce or consume the amateur media. Second, no matter how nice the Web viewer, the unstructured Internet will always be much harder to use than an online service.

4. Return of VR

Apple's announcement of QuickTime VR, a system extension that allows 3-D scenes to be zoomed and panned, was marked by a headline that read, "VR without all the prohibitive hardware." An amazing deflation of expectations has occurred here. Three years ago, VR meant being able to play and create in an absorbing, synthetic environment; today, it means 3-D animation. Watch for an escalation of VR hype as Nintendo's new, rather ambitiously named "Project Reality" gaming system gets closer to release in the second half of 1995.

5. Robotics

There was something pitiful about watching Dante, the US\$1.7 million robot developed by NASA and Carnegie-Mellon, slip in a pool of mud. This was definitely not the giant step for robotics some had hoped. True, robotics is a hard problem; true, the public has unrealistic expectations. Nevertheless, progress in robotics has been exceedingly slow. Part of the problem is poorly focused research – other than the shrinking military, no one seems to have a clear idea what robots are for. Plus, NASA's involvement almost guarantees that progress will be slow and expensive. Let's just decide on what we want and turn the problem over to Sony.

– Steve G. Steinberg (hype-list@wired.com)

Follow the Bouncing Ballz

Since the massive success of *Street Fighter II* – soon to be a major motion picture starring Jean-Claude Van Damme and his buns of steel – the fighting-game genre has become the me-too market of the '90s. To stand out these days, a beat-'em-up needs more than good game play: it also needs a gimmick. In *Ballz*, it's animated spherical figures.

Ballz is a one- or two-player game with a selection of eight fighters. (My personal faves are Boomer, a clown who can blow himself up, and Kronk, a loogie-hocking cave-man.) Only three play buttons are used, making the fighting moves less complex than other games; some players



It's got looks and humor.

will hate this, but others (like me) won't mind.

Ballz features "morph moves" that let you change into other fighters, and an instant replay feature to view a match from various angles and distances. When you win, you get to play the game again as one of the super-powerful bosses.

Ignore the dreadfully silly title – *Ballz* is an excellent game, with a welcome sense of humor and a visual approach that introduces some much-needed originality. – Zach Meston

Ballz for Sega Genesis and Super NES: US\$59.95.
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Zipples

While netsurfing recently, I mistyped a file search and came up with a microscopic movie-like thing that described itself as a zipple. Searching America Online's software libraries for "zipples," I discovered over 400 different files, with more being uploaded every day.

Zipples, it turns out, are to graphic arts what haiku is to poetry: color animations so tiny they frolic on a Macintosh menu bar. The interface is irresistible – simple, easy to use – and encourages fiddling. The preview screen doubles as an editing canvas and each frame is so tiny it takes only a few clicks to create something new.

The best zipples are



Frolicking menu bar art.

simple: a lava lamp, a spinning Coke can, a sprouting Chia pet. And there's more: the Photoshop icon now winks at me, and the AOL symbol morphs into a dollar sign, sprouts wings, and flies away. No cultural icon is safe from the zipple onslaught: Gumby, PacMan, even the Mona Lisa have been zipped. Within hours of O.J. Simpson's televised car chase, a "Juice on the Loose" zipple was cruising the infobahn.

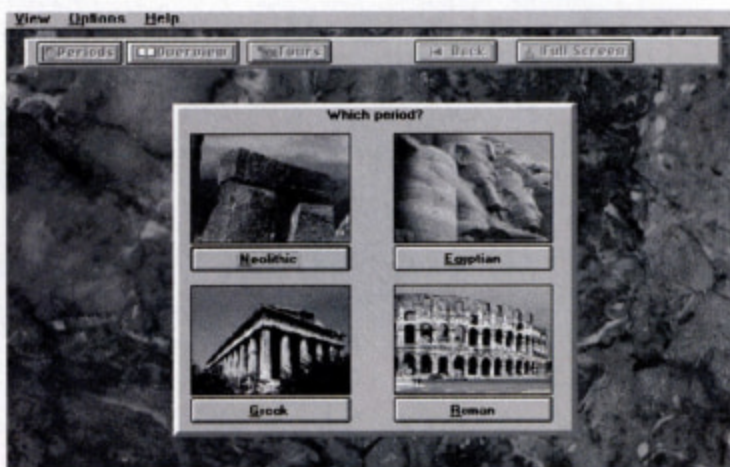
With no money in zipples, artists are the technological incarnation of graffiti artists, creating images and posting them for the world to see. – John Cartan

Zipples: Download Zipple 1.9.2 using AOL's "MacSoftware QuickFinder."

Medio Magazine

Medio Multimedia Inc., the CD-ROM company that brought the Zapruder film and grassy knoll to disc – *JFK Assassination: A Visual Investigation* (see *Wired* 1.6, page 27) – are here with *Medio Magazine*, a magazine in the same medium. The question is, What can a CD-ROM magazine give you that a printed one or one delivered online can't?

Online's advantages are in publishing costs and schedules. Print's are in graphics and resolution. What CD-ROM can do is indexing, and *Medio* has done this well enough that you can get caught up in searching the disc. But *Medio* seems absolutely packed and bulging with words and images, many of dubious value when presented on a video screen, such as the entire text of the *Wizard of Oz*, along with the art from the first edition of the book. The image quality and text resolution are not as good, of course, as that of a printed magazine, and the news stories – most of them off The Associated Press wire – are months old.



Tune in for the video clips, not timely news.

What *Medio* presents most intriguingly is a set of video clips – movie trailers. There's something intriguing, if only for its novelty (which wears off quickly), about seeing the trailer you saw at the local bijou in a box on your screen.

Medio does not answer the question of whether a "discazine" or "magadisc" makes sense. Yes, the editors have steam shoveled vast quantities of news wire material onto their disc, but so in effect do the rewrite desks of print magazines.

Newsweek offers a CD-ROM version of its issues, and more discazines/magadiscs are cropping up. And while *Medio's* effort seems aimed largely at promoting its CD-ROM products, it's not a bad start for a medium that will surely evolve. – Phil Patton

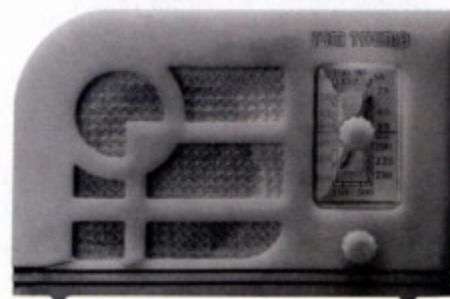
Medio for Windows: 12-issue subscription: US\$59.95. Medio Multimedia, Inc.: (800) 788 3866, +1 (206) 867 5500.

AM Radio's Reprieve

To know how good AM radio can be, you need either a long memory or a new radio – one with AMAX certification.

When all radio was AM, broadcasters and radio manufacturers labored for the best possible AM sound. But in the '60s, AM faded as the world discovered FM – static-free and with wider frequency response. Radio makers concentrated on their FM sections, cheapening the AM side. Broadcasters stopped caring about good AM sound; many stations deliberately avoided it, broadcasting in a perpetual scream to grab more listeners. Even the coming of AM stereo didn't help. It was a decade late, and the FCC screwed up by allowing a confusing rash of stereo standards instead of just one. And all the while, the world was filling up with gadgets (fluorescent lights, computers) that could choke all but the best AM radios with static.

The AMAX standard is a last-ditch effort by broadcasters and radio makers to save AM by reviving a



AMAX radio won't choke your stereo with static.

long-forgotten tactic: quality. To meet the standard, a radio must have enough audio bandwidth (at least 50 to 7,500 Hz) to let you hear most of the music, plus a switch that lets you narrow that bandwidth to cut interference and get rid of that fuzz on distorted signals.

So far, there's just enough AMAX equipment to cover all the bases. For portable use, Sony Electronics Inc. has the SRF-42 Walkman radio (US\$34.95) and GE has its Super Radio III (Model 7-2887, \$59.95) with a big speaker. For your stereo system, Denon Electronics makes the TU-680NAB Tuner (\$600). And all the AM stereo radios Delco Electronics Corporation makes for GM cars meet AMAX standards, though the Delcos with only mono AM don't. With a good station (often hard to find), their AM sections sound so good you could easily be fooled into thinking they were FM. – Ivan Berger

SRF-42 Walkman: US\$34.95. Sony Electronics: (800) 222 7669, +1 (201) 930 1000. Radio III, Model 7-2887: US\$59.95. GE: Available at select retail locations. TU-680NAB Tuner: US\$600. Denon Electronics: +1 (201) 575 7810.

STREET CRED CONTRIBUTORS

Ivan Berger, Technical Editor of *Audio Magazine*, has been writing about audio and other aspects of electronics since 1962. As an Altair owner in 1976, he was one of the first with a home computer.

Colin Berry (cpberry@aol.com) clutters the pages of *Option*, *Ray Gun*, *SF Weekly*, and the upcoming *Happy Mutant Handbook*.

John Cartan (johncartan@aol.com) is a database interface ace and editor of the electronic journal *Archipelago*.

James Denning (hubcity@aol.com) designs games for Music Pen, Inc., performs for the comedy group Hub City Spoke Repair, and naps on buses in between.

Kennedy Grey, of Seattle, sleeps two hours a night, has his Mac rendering 3-D animation around the clock, and plays handmade electronic drums fabricated from PVC tubing.

Phil Hall is a New York-based writer and film scholar whose work has appeared in numerous American and British publications.

Brian Higgins (bryan@well.com) plays the French horn and clavichord, writes fiction and software, and lives in Berkeley and Soda Springs, California.

Dave Hughes, cursor cowboy, tries to ride the electronic frontier five years ahead of the crowd and teach settlers how to ward off any corporate ranchers who might be following.

Rita Johnson is a transplanted Midwesterner trapped in Los Angeles. She spends her free time entertaining friends with her delusional fantasies about Tim Roth.

Richard Kadrey (kadrey@well.sf.ca.us) is the senior editor at *Future Sex* magazine as well as author of the novels *Metaphage* and the forthcoming *Kamikaze L'Amour*.

Todd Krieger (tkrieg@eworld.com) is a reluctant nomad in search of the perfect chili dog.

Steven Levy (steven@echoyn.com) is a Fellow at the Freedom Forum Media Studies Center. He is author of *Hackers*, *Insanely Great*, and other books.

Dennis McCauley (74452.1137@compuserve.com) is a freelance writer. He works late. He doesn't get enough sleep.

Zach Meston (vgzach@delphi.com) resides in Hawaii and writes videogame strategy books for a living, a lifestyle combination that makes most people insanely jealous and physically ill.

John Morkes writes about science and technology, but prefers to write love letters.

David Obst is a writer and producer in Hollywood. He worked on *Revenge of the Nerds*, and is developing a CBS special on television in the year 2025.

Gregory J. Pleshaw (gregoryp@well.sf.ca.us) is currently in hiding in some remote locale of northern California pending completion of his first novel.

Phil Patton is a frequent contributor who wrote "Caught" for this month's issue, *Wired* 30.1.

Dr. Rhythm (Alastair Johnston) is a letterpress printer and a teacher of graphic design who broadcasts over the San Francisco radiowaves.

James Rozzi (rozzi@mail.firn.edu) is a freelance writer, woodwind musician, and teacher in the Orlando, Florida, area.

Dan Sicko is a programmer/analyst and freelance writer. He still does not have the Sci-Fi Channel.

Dean Suzuki, PhD, is a professor of music history at San Francisco State University.

Steve G. Steinberg (tek@well.sf.ca.us) is a computer science student and the editor of *Intertek*, a technology and society journal.

Scott Taves (staves@aol.com) is music director at Reactor, an interactive software developer and publisher in Chicago. He's partial to machine music.

Rogier van Bakel (rogier@n1@aol.com), as anagram enthusiasts will note, has *Brave Ink Galore*. He is a Dutch correspondent in Washington, DC.

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net surf

edited by Kristin Spence

Communicating with Your Clothes On: A Beginner's Guide to Pretty Good Privacy Encryption Software

Sometimes, communicating on the Internet reminds me of those dreams in which you find yourself standing in a public place with no clothes on. There you are, electronically naked in front of a host of strangers and who knows how many curious government spooks. Which is probably why firing up PGP (*Pretty Good Privacy* encryption software) made me breathe a sigh of relief: PGP's like a good set of Levelors – or at least a comfortable robe. To think of it another way, PGP is the difference between sending a postcard and sending a letter in one of those cross hair security envelopes.

When you use PGP, everything you send looks like random garbage ASCII characters to all unauthorized observers. Better yet, there's no practical way for a snoop to crack the code with today's processors. According to Stanton McCandlish of the Electronic Frontier Foundation, "I think PGP is secure enough to last for ... five years, maybe longer Right now, it would take centuries to crack even one PGP message." Pretty good, for freeware.

I and every other Net nebbish out there have been hearing about this PGP and Clipper Chip stuff for a while now, but encryption has always seemed a black art. To prove myself wrong, I began assembling the E-Z instructions set forth below. Though I did it on my Mac, PGP is also available for MS-DOS, UNIX, VAX/VMS, and other OS flavors. (You can get the specifics for your machine when you download the PGP software.)

Basically, if I can do it, so can you. And in the interest of civil liberties, we all should do it. The instructions (again, the E-Z version) go something like this....

Download the right PGP software for your computer from the Internet (it's free – see below for more details). Use PGP to generate a personal, unique pair of keys: one is public (the incoming

"decoder"), the other private (the outgoing "scrambler"). Once you're set up, you'll distribute the public key to the world at large so that people can decode stuff you've encrypted for them specifically; Sit right down and write yourself a letter ("this is a test, this is only a test"). Encode it with PGP, designating yourself as the recipient. If you look at the resulting file with a text editor, you'll see only nonsense. Decode it and you'll see your letter again. Send your public key to any keyserver – the key is simple text, which means it's e-mailable – and it will automatically go to all keysevers. You can request other people's public keys from either a keyserver or the individual (for more details, see below). Use your PGP software to add them to your "key ring." Now, by using this list of public keys, you can encode stuff so that only a specified person can read it, and, in the reverse, only you can read the scrambled messages intended for you.

My biggest gripe about PGP is that most mail programs don't incorporate it directly. This means it takes more than one program to read your PGP-encoded mail. Luckily, this is no big deal in a UNIX or DOS environment, where it's simple to send the output of one program through another. Scripts to integrate PGP and mail are out there for many environments; the new MacPGP will supposedly have Apple Script support.

To get a current list of sites where you can get PGP software, as well as more specific information about how PGP interfaces with your particular brand of computer, send an e-mail message to info-rama@wired.com, with `get 3.01/departments/getting.pgp` as the only text in the body of the message, and the information will be bounced back to you. PGP: it's what the best-dressed brains are wearing. – Thomas Hays (tom@crl.com)

Sprayed and Displayed

Outlawed in the streets, graffiti art has a new home in cyberspace. Now embodying digital bits in the vast global bitstream, this furtive, subversive art form sprays a symbolic place on virtual walls. *Art Crimes* is a graffiti art gallery exploding with vibrant expressions of creative human communication from all over the world. Bring your social consciences and a taste for the real to http://www.gatech.edu/desoto/graf/Index.Art_Crimes.html, then stop, look, and ponder.

Objects of Desire

When they can't reach for the Fetish section of *Wired*, hardcore gearheads cruise the curls of *alt.toys.hi-tech*. There, you'll find descriptions of the latest technophile toys that will make even the experienced fetishist's mouth water – exotic caller-ID boxes, sleek portable DAT players, VirtualVision TV glasses, and other elite gear. Both James Bond and Q would think they'd died and gone to gadget heaven.

Skate This!

Hit *alt.skate-board* before you hit the pavement, and chances are you'll be able to successfully tell a 360 kickflip from a switchstance heelflip (no guarantee you'll be able to execute either, however). You'll also find useful info nuggets about the pro circuit and the best places to catch air. This news-group sports a regularly updated skateboarding FAQ, as well as ads for wholesale decks, trucks, and wheels. Whether you're an old-school wideboarder or new-school stunt demon, it's worth rolling in and twisting through a 180 double lurk.

Genetic Exhibitionism

If you were intrigued by "Genetic Images" (*Wired* 2.09, page 114), then you should definitely check out this algorithmic wave. *International Interactive Genetic Art* is a Karl Sims-inspired Web site that offers beautiful, full-color images based on genetic algorithms. Surfers can influence and create new hybrid designs by voting on the displayed images. As each new tier of pictures is created (or "bred," as it were), you can continue to vote, amping up the images' complexity. An up-to-the-minute version of any WWW browser and a full-color monitor are mandatory. Check out the Genetic Movies, too! Cut over to <http://robocop.modmath.cs.cmu.edu:8001/htbin/mjwngenforml> and cast your vote.

This Is a Modern World

Dan Perkins (aka Tom Tomorrow) self syndicates *This Modern World* – one of the funniest and most astute political cartoons around – to over 70 papers nationwide. Earlier this year, Perkins bought a used 8086 PC clone and a 2400-baud modem and began hanging out in the Well's media conference. He's also begun printing his e-mail address, tomorrow@well.com, in his cartoon. Now, surfers can get

Basking in the Light

Surfers who don't mind donning another wet suit can now catch an Arctic current to Norway's *Northern Lights Planetarium* – the first structural and virtual planetarium in this exquisite country. The planetarium's main page offers a picture of its facility, situated in its ice-bound locale, as well as access to program highlights, schedules, and information about the planetarium itself – including a map of its location, and the names, titles, and, in some cases, home pages of the planetarium's staff and board members (even shareholders are listed).

Perusing the program lineup will show you a variety of stellar subjects. Standard programs cover topics from the "Star of Bethlehem" to "Soap Box Rockets." If you can get there, relax with a program on "The Four Seasons," a cyclical tour de force that showcases Antonio Vivaldi's classic of the same name (link to "movie sound"). Or learn about the space shuttle, its dangers, and the profound, engulfing silence of space. "Arctic Light," the planetarium's headliner, delves into the fact and lore of the Aurora Borealis. Be sure to read the program's informative, almost poetic abstract. This is not a planetarium show per se, but one presented in their Cinema 360 format, as is the "Genesis" program (a nature film showing the drama of volcanic activity as the earth destroys, then rebuilds itself).

Revealing an international sensibility, the site offers text in English, Finnish, and German. The translations, and word spellings, are good, even quaint at times. And there's even a link to the Norwegian home page here. Access this interstellar gem by cutting a frigid curl to <http://www.uit.no/npt/homepage-npt.en.html>.

Canned Juice

Tabloid surfers can now grab a front row seat and see the action in CompuServe's new *OJ Simpson Forum* ([go ojsimpson](http://go.ojsimpson)). Conspiracy theorists who can't wait for the Oliver Stone movie can examine the arrest warrant or download defense motions. Armchair lawyers can wallow in self-serving rants and confusing explanations on message boards such as "DNA Testing," "Domestic Violence," and, of course, "Get a Life." But the real action's in the library: imagine how jealous your friends will be when you show them OJ's mug shot GIF turned screen saver or those blueprints for a new Pez dispenser as modeled on the coroner's drawings of Nicole Simpson. Dig up Nicole's 911 phone transcripts or the popular "graphic crime scene" GIF that's racked up 885+ downloads since late September. Peruse the jury questionnaire in all its "Are you now, or have you ever been, a fan of the Buffalo Bills?" glory.

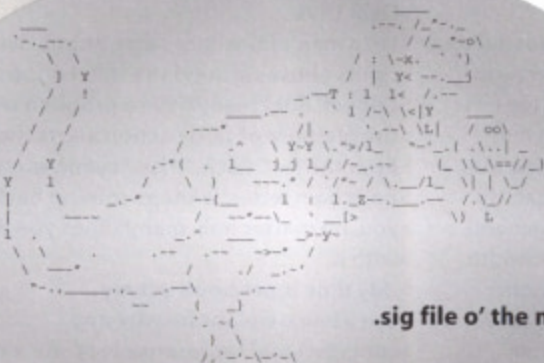
It's a rare forum that centers around one question with only two possible answers, but there's plenty of passion in discussions of police wrongdoing, OJ's motives, or the crime's proximity to his own children. Self-ordained experts routinely flame newbies who haven't followed the 100+ message threads; most seem to sit on the "guilty" side of the fence, but public conversions are frequent. Don't be surprised if OJ's defense borrows a few of the more successful arguments.

Is the OJ Simpson Forum just another sad reflection of America's cultural decline or a valuable enhancement of the most publicized celebrity mishap since Tonya Harding? You be the, er, judge.

each *This Modern World* installation on the Web – one month after it has appeared in print, that is. Dan also throws in a few favorites, just for good measure. Bring your text grabbers and head to <http://www.well.com/Community/comic>, or *gopher* into *wps.com* and prepare to be amused. To get his semi-regular newsletter, send Perkins an e-message. Don't put off today what you can do ... oh, you know.

Do You ...

If you're temporarily putting aside the black Body Glove for that wet suit in white, shred one over to alt.wedding. For those couples opting out of a trip to Vegas or an e-service, channel your frustrations to the simpatico souls of this newsgroup. Gripe endlessly about the upcoming Event without boring your friends or antagonizing your relatives. Everyone here is in the



.sig file o' the month

same hellish boat and is nervous as hell. ("Can someone repost that gowns-by-e-mail address?" "Help, we want to hire a bag-piper!" "There's mutiny among the bridesmaids!") Offering support, newlyweds who have recently walked through the fire shout "You can do it" – like everyone's about to run across hot coals. Take a deep breath and run, so to speak.

Entre Nous

In the secure environs of *Community ConneXion*, founder Sameer Parekh has created a community-oriented network site, linked to the worldwide NEXUS-Gaia movement. C2, a NEXUS Berkeley-linked service provider, is explicitly privacy oriented. Parekh, a young, anarchistic cypherpunk, is dedicated to privacy through strong cryptography. Community ConneXion offers shell accounts that include access to e-mail, Gopher, Lynx, and Usenet, while also keeping subscribers up-to-date on the newest and best versions of all Internet products. But in the area of privacy, C2 really shines. Of course, PGP is used and supported, and members can sign up for anonymous alias accounts. Unlike similar accounts offered by other services, C2's accounts are double blind, meaning that neither C2 nor Sameer

knows who, or where, you are. For more information, send e-mail to info@c2.org. To check it out for yourself, stealth surf to <http://www.c2.org>. Activate cloaking device.

Star Chart Navigation

Your boss is on a rampage, the printer's not working, and you can't seem to communicate with anyone. Are you having a bad day, or is Mercury just in retrograde? One quick way to find out is to astral-project (via your Web browser) to

Justin Hall's *Astrology Page* at <http://cyborganic.com/~Justin/astrol> and

find out. Though still under construction, this starry strand of the Web is brimming with vital statistics. The main page opens with a simple yet lucid analogy, which is a great help in understanding the "staples" of astrology – namely, the signs, planets, and houses. Links to these three points go deeper into the individual realms of each category. For instance, linking to signs will show you a complete rundown of the twelve sun signs and their corresponding symbols. A level deeper, you will find detailed descriptions of the elements, qualities, guiding principles, ruling planets – even the anatomy associated with each sign. Linking to houses will present you with an empty wheel from which you can get a description of each house and what it "rules."

Everything is interconnected for easy cross referencing. Soon to come will be explanations of points of fortune, rising signs, and more. If the site leaves you thirsting for more, the main page also links to other astrology-related sites, such as *alt.astrology*, Rene Mueller's *Astrology Page*, and Rob Brezsney's *Horrorscopes*. Scrolling all the way to the bottom of the main page will bring you to Justin's *Links From the Underground* ... but that's another story that will have to be told elsewhere.

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netiquette

>On 10/31/94, a generous reader wrote:

>Dear Diva,

>What is it with student newbies who post
>questions that reveal that they haven't
>done even the most basic research on their
>own? A typical example: "I'm supposed
>to do a paper on Thermocumbustible
>Triangulation. What is it? Can you send
>me lots of information?"

> Do they sincerely expect help? Am I
>overreacting?

>Signed,

>A Professional

Dear Suit,

Bless you for being so magnanimous with these delightful little Net.heathens. As you are a professional, the Diva would urge you to work those talents, hon: be generous – go ahead and help. Then slap them with a bill covering your consulting fees. (Say US\$125 an hour? That ought to give them something to research.)

But I digress. What you should do is of course direct them to the nearest FAQ (and if they don't know what that is, well, they're on their own).

Good luck! Biz should pick up after winter break.

Net.hugs,

Dame Raquel, Network Diva

>On 11/02/94, a systems administrator
>complained:

>Dear Diva,

>OK, so I have a gripe. It has to do with
>listservs – specifically, people wishing to
>be removed from them. How many of us
>have received mail that shouts "REMOVE
>ME FROM THIS LIST?" Or notes crying
>"Unsubscribe?" What's more, these
>missives have obviously been sent to
>everyone else who subscribes to the list –
>this could mean thousands of people.
>How can we make them stop?

>Signed,

>Sick Of It All

Dear Under the Weather,
Fabulous point, dear.

Oh, you screaming unsubscribers. When you first subscribe to any list, your confirmation note will state, in detail, how to remove yourself from that list.

In most cases, a simple note, addressed to the list processor's address, with None in the subject heading and Unsubscribe List-Name-Here as the body text of the message, will do the trick. To do anything else (like, say, posting little missives quaintly titled "Get me off this list!" to the general list) will only take up precious bandwidth and the valuable time of others whom you'd not wish to piss off. Come on now sweeties; as Voyager says, bring your brains!

In Sympathy,

Dame Raquel, Network Diva

>On 11/05/94, a cantankerous reader wrote:

>Dear Diva,

>This isn't so much a question as it is a
>statement. I'm tired of hearing people
>gripe about flames and cascades and other
>lapses in social "niceties" online. It's
>the Net, for chrissake. It's warm up here.
>Get the hell used to it or go home.

> Anyway, I've found that, usually, what
>people read into messages is hardly what
>was originally intended. However, when it
>turns out the insult was intentional, well,
>then it's time to start dialing the propane
>tank to "well done." Heh.

>Signed,

>Grow A Spine, Please

Dear Lumbar Support,

Though nonflammable, these "niceties" you are so quick to malign can actually be a great vehicle for wit and rancor: observing tried-and-true literary customs allows one to get a warm point across with a great deal of finesse. (Even if you offend, you may still emerge with respect.)

The Net is much like the Wild West of old: male-dominated, violent, untamed, and desperately in need of domestication (I'm talking sophistication here, sweetie). You would be doing yourself, and many others, a great service by helping it evolve, and

you can do this by not only saying what you mean, but also saying it with the restraint of deft, well-crafted prose. Set an example. And please ... put that childish little propane tank away. You'll shoot somebody's eye out.

Net.hugs,

Dame Raquel, Network Diva

>On 11/09/94, a harried reader wrote:

>Dear Diva,

>I'm a man of the '90s. I care about civil
>rights abuses around the Net. I oppose
>Clipper. But I really have a problem with
>the plethora of tardy action alerts that
>litter the Net. Each "crisis" reminds me of a
>bad chain letter: it keeps coming back to
>you, no matter how many times you deal
>with it.

> My time is precious, yet my
>conscience weighs heavily (my
>congressional representatives know me
>by name now). Is the answer to simply
>not answer?

>Signed,

>Wracked With Guilt

Dear Stretch,

The Diva believes it a pity that many sophisticated people continue to post alerts without a clue. Waken your social consciences, people – and pay attention to the date! Much like intercourse, timing here is everything.

Allow me to give you some condensed pointers on navigating the world of action alerts, courtesy of His Net Eminence, Professor Phil Agre: scan for clear information on the sponsoring organization; look for a date, in a place other than the header; avoid regional crises that don't explain how "outer-regional" folks can make a difference or get involved; look for sanity and concise writing.

The Diva advises you to pick your fights carefully – the digital battlefield is vast and cluttered with memefields.

Net.hugs,

Dame Raquel, Network Diva

Got a question about netiquette? Perhaps a gripe? Write Dame Raquel, Network Diva at netiquette@wired.com. (And don't post with your mouth full, hon!)

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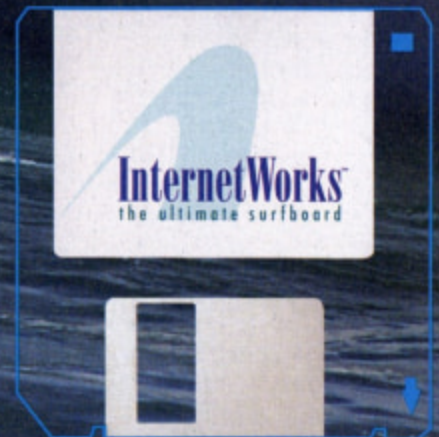
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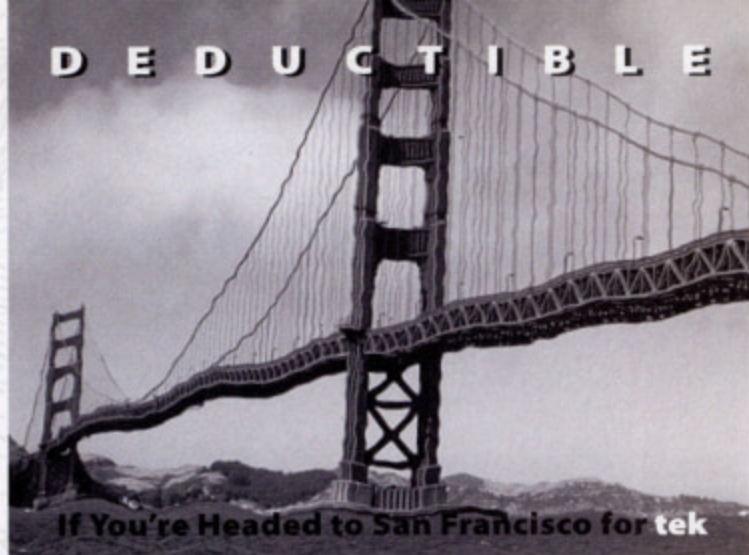
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This historic port – land of earthquakes, absurd hills, and natural air conditioning – is a modern flux of recent graduates, Asian and Latin American immigrants, and tourist-filled cable cars. But San Francisco is less a sprawling metropolis than a collection of small, eclectic neighborhoods.

In Chinatown, wander through cluttered shops that sell cheap porcelain, ginseng, and pillow-sized bags of dried shiitake mushrooms. Squeeze back into the kitchen of **Mee Mee Bakery**, on Stockton Street, and watch the little origami edibles spill out of the fortune-cookie machine.

The edges of Chinatown melt imperceptibly into North Beach, an area of pricey Italian tourist traps. But your buds and your budget will be equally pleased with some bread and cheese from **Panelli Brothers Delicatessen** and a bench in Washington Square. Pick a postcard for Mom and Pop at **Quantity Postcards**, and sit down with pen in hand at **Caffè Trieste**, once a Kerouac favorite. Four decades after the beats dug North Beach, though, it's the Mission district that claims the city's highest funk-per-capita ratio. Explore the used-book stores and hip barrooms around Valencia and 16th Streets. You'll find a *taqueria* on every corner, but we recommend **El Toro**, where the salsa verde is sublime. Enjoy a refined cocktail at the **Slow Club**, and then swing around the corner to the stylish **Universal Cafe** for some roasted salmon. But nothing compares to the well-designed "tall food" of the **Flying Saucer**, from the Five Spice Prawns to the

Chocolate Smokestacks.

Day or night, **Cafe Flore**, also known as Cafe Hair-do, is the spot for an al fresco caffeine injection and a dose of Castro spirit. From there, take the scenic 37-Corbett bus down into Haight-Ashbury, and alight at the popular **Cha Cha Cha**, a kitschy Caribbean tapas place. Soothe your inevitable wait for a table with a cold pitcher of sangria.

Although the rave rage has subsided, the club scene still thrives in the SOMA (South of Market) area. Roll down to **Bottom of the Hill** for great local alternative-rock bands nightly, or visit the re-opened **Fillmore**, a spectacular turn-of-the-century theater – the doorman greets you with a tub of red delicious apples. At the modern, black-lit **DNA Lounge**, dance to hip-hop or house, depending on the night. On Friday, hordes of inline skaters glide through the city, ending up at **Club DV8**. But inexperienced skaters might prefer a Sunday in **Golden Gate Park**.

Take a field trip to **The Exploratorium**, an interactive science museum – leave your shadow on the glowing walls of the Shadow Box, blow giant bubbles, and romp in the Multimedia Playground.

For the ultimate view of the bay and the skyline, cross the Golden Gate Bridge and ascend the rolling hills of the Marin Headlands. But there are plenty o' views in San Francisco as well. As you hike the city streets, remember that the ache in your legs is directly proportional to the view from the peak, so pause to enjoy it and catch your breath. Where *did* you leave that oxygen tank? – *Jessie Scanlon*

January 12-16

MILIA '95; Cannes, France

Last year's sellout debut made MILIA, the International Publishing and New Media Market, the talk of the multimedia conference circuit. General sessions, workshops, and panels will cover specific issues of creative content, production, and distribution. With delegates from the creative and business sides of the industry, as well as from both sides of the Atlantic, MILIA is also an opportunity to negotiate licensing rights and international distribution deals. Registration: \$3,498 (US\$647) per person, \$2,312 (US\$428) each additional person. Contact: Diana Butler, +1 (212) 689 4220, fax +1 (212) 689 4348.

January 21-24

tek: The Dive Technologies Conference & Exhibition; San Francisco

Attend sessions led by "underwater visionaries" and play with high-tech equipment you can't afford. Technical sessions will cover underwater imaging, rebreather technology, and atmospheric diving systems, as well as how to get started. And if all the talk makes you want to get your feet wet, sign up for the weekend of diving in Monterey Bay organized by *aquaCorps Journal*. Registration: US\$199, clinics not included. Contact: (800) 365 2655, +1 (305) 294 3540, fax: +1 (305) 293 0729.

February 1-3

Imagina; Monte Carlo, Monaco

This computer-graphics rendezvous will cover cyberspace society and art. View the best computer animation and video projects in the screening room and cast your ballot for the 1995 Prix Pixel-INA winners. Registration: full conference package \$5,527 (US\$1,045), students \$2,787 (\$526); conferences, round tables, and exhibit also priced individually. Contact: +33 (1) 49 83 26 93, fax: +33 (1) 49 83 31 85 before January 25. Or, register on site.

February 22-25

TED6 Conference; Monterey, California

TED6 will close the popular TED series, devoted to the convergence of technology, education, and design. This year, yet again, the list of eclectic speakers will make you drool: John Perry Barlow, Douglas Coupland, Frank Gehry, Stephen Jay Gould, Quincy Jones, Kai Krause, and John Warnock (of Adobe Systems), among others. Participation by the equally illustrious audience will be the icing on the cake. Registration: US\$2,000. Contact: +1 (401) 848 2299, fax +1 (401) 848 2599.

March 5-8

PC Forum; Phoenix, Arizona

It's time to bite the bullet and subscribe to *Release 1.0* (US\$595 a year) if you want to attend PC Forum, Esther Dyson's conference for the digital elite. As the "Local to Global" theme suggests, the *crème de la techno-crème* will discuss how communications technologies are redefining our concept of community. Registration: price unknown at press time. Contact: Daphne Kis, +1 (212) 924 8800, fax +1 (212) 924 0240.

March 8-15

CeBIT'95; Hannover, Germany

Multiply Comdex by three, move it to Europe and what do you get? CeBIT'95, the World Center for Office, Information, and Telecommunications Technology. Highlights include Opportunities (*Chancen*) 2000, an environmental impact program, and the CeBIT Banking Center, focusing on security and banking technology. But bring some comfortable walking shoes – CeBIT covers 3.1 million square feet of exhibit space. Registration: US\$48. Contact: +1 (609) 987 1202, fax +1 (609) 987 0092.

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Prague

◀ 106 the government organ *Rudé Právo* discussing the Plastics (September 25, 1976): "Our society will not tolerate any forms of hooliganism or public disorder, and quite naturally, will resist any moral filth and efforts to infect our youth with that which every decent man condemns and which harms the spiritual health of the young generation." By "quite naturally," the authorities meant beatings, bannings, constant police surveillance, and prison.

And when the return-of-the-repressed came, and the regime cracked and fell apart, these mad hippies acquired a cultural authority and credibility like no mad hippies have had ever before, anywhere, any time.

When Václav Havel showed up to address big crowds during the Velvet Revolution, most

underwear. The street market closes down at five o'clock sharp, and after that lovers go there to sit on the tables and kiss.

Crime statistics show that the modern Czech Republic is about half as dangerous as Germany, which is to say about half as dangerous as warm dishwater. That's *not* to say that you can't find trouble in Prague. There are pickpockets, bag thieves, corrupt taxi drivers, hookers, occasional drunk-rollers, short-change artists, and a lot of drugs. But if you arrive here and you're a young American man, then, statistically speaking, you and your fellow Americans are by far the most dangerous people you are ever likely to meet here. Czechs will be rather impressed by your strapping good health and may even be slightly afraid of you. You'll be big and rich and loud and from a country that won the Cold War.

There are quite a few American business people here, but they don't set the tone. The tone is set by graphic artists and wannabe musicians and common-or-garden slackers off to drink great cheap beer on Dad's money, and there is an absolute load of poets. You can't turn around without tripping over a poet.

of his listeners, even in his own home city of Prague, had only a vague idea who he was. Czech underground publications, manually typed, and smuggled hand-to-hand, had such tiny circulations that modern émigré small-press efforts like *Yazzyk* and *Trafika* are booming enterprises by contrast. Living in Prague offers a way to take small-press publication seriously. It offers living proof that artists and writers can make a real difference, with no money, no backing, next-to-no audience, and savage and heavily armed official disapproval.

And besides, it's very pretty here, and it's cheap.

I'm now back at the desk again, two days later. I went to visit a place publicly declared to be "one of the most dangerous places in Prague" by the Prague police. It's the outdoor market by the subway station in Náměstí Republiky (Republic Square). I expected a maelstrom of prostitution, violence, and corruption; what I got was about 30 hippies at little wooden tables trying to sell lipstick, love beads, and women's

And no matter what a pampered, Yankee, swaggering lout you are, they'll never resent you as much as they resent the Germans.

September 19. I'm now typing at a wooden table, artfully painted in vivid red and black, at the Libri Prohibiti Library downtown, a library of forbidden books. This modest enterprise is the central historical storehouse of Czech *samizdat*, or illegal self-publication. Chief librarian and founder Jiří Gruntorad runs this mind-boggling archive, which contains 4,400 underground books, plus some 6,000 previously forbidden publications in Czech by Czech refugees and émigrés.

People were once imprisoned for owning the very books in this place. People pored over these books in secrecy with feverish intensity. People typed these books, letter by letter, on manual typewriters (some of the typewriters are here), bound them in primitive wooden presses (they have the presses on exhibit too), and cut them on monster iron paper cutters that look like instruments of the Spanish Inquisition. This place is a

Communist censor's nightmare, and all the better for that.

There are legendary publications here, formerly despised contraband transmuted into treasured cultural monuments. There are complete runs here from Václav Havel's pre-liberation "press," the *Edice Expedice*. There are complete editions of the forbidden poetry of Egon Bondy. There are homemade books produced with such loving care that they look just like real books, and there are also moldering, little green and yellow pamphlets that are acts of utter desperation and fading carbon paper. There are matchbox-sized forbidden books with antlike print that come with a half-round magnifying prism stuffed into the spine so you can read them line by line by line.

The two-story walk-up into the library is dusty and gloomy, with graffiti and cracked glass. But inside, the library is determinedly cheerful, all opened window shades and bright primary colors. Old posters for Charter 77 and Amnesty International share the walls with posters for modern Czech counterculture rags like *Revolver Revue* and *Vokno*. Gruntorad, who spent four years in prison during the regime for his book-smuggling activities, looks like a medieval Slavic saint. Mrs. Gruntoradová, who also runs the place, is a direct and level-headed woman of such vivid and obvious integrity and humanity that I would unhesitatingly trust her with my car keys, my door keys, and the care of my only child, even though we share no common language.

In this storehouse of words-in-a-row, so pungently redolent of terrible fear and incredible resolve, young Czech volunteers type on spanking-new computers, and run off pages on big shiny photocopiers, and answer phone calls, and chatter in Czech, and laugh aloud. It's a quiet place, but it's a happy place and almost, in its own odd way, a holy place. I sit here typing on my portable computer and I feel, with great immediacy, that *samizdat* is a spiritual ancestor of everything truly important in my life.

Samizdat is what a counterculture looks like when the forces of repression compress it as hard as a diamond. *Samizdat* is a spiritual ancestor of fanzines, bulletin board systems, fidonet, the Internet, the World Wide Web, shareware, free personal cryptography. And the world outside these windows, the whole world now, is what a world looks like when *samizdat* is winning.

A bearded young man from the staff just brought me hot coffee and asked me to sign the library's guest book. Václav's looping signature is right here on page 1. I just

inscribed *information wants to be free* and signed it with my Internet address.

There may not be such a thing as a Prague voice, but there is such a thing as a Prague look. It doesn't show quite so much on the men, who basically dress like Michael Stipe clones only with cigarettes and backpacks. But there are young women all over Prague, especially the downtown, old-city areas – bookstores, art galleries, coffee-houses, and bars – who are instantly recognizable as core scenesterettes and muses-in-training. Praguélodettes, one might call them. Let's take the Prague look head-to-toe.

The hair is straight, shoulder-length, blunt-cut, severely parted in the middle: your basic Ingenue Heroine of an Epic Russian Novel do. In the ears – pierced of course – silver filigree earrings. Then comes a big, baggy sweater, often loose at the neck to reveal the straps of a halter top, hanging right down to the wrists and stretching to about mid-thigh. Under the tuniclike sweater is a big flowing skirt, a hippie drawstring job in black and white print pattern, very thin fabric usually, but pleated or wrinkled, and ankle-length. Under the patterned skirt, black leather shin-high boots with silver lace-ups. Maybe black flats or big, funky Doc Martens. The effect is a cross between *Anna Karenina* and Greenwich Village 1912.

Accessories: a big, brightly patterned scarf or shawl, street-vendor silver necklaces with amulets, bracelets made of horn or wood, a black woolen beret, stone and ceramic finger rings, cigarettes, a neat little denim backpack. Maybe a hair-wrap, a technique that braids a single long strand of hair into a tight sleeve of thin colored yarn. (If you're up for it, hipster kids will hair-wrap you right on the sidewalk, for a few korunas.)

For the popular Goth Chick variant, black nail polish, scary big pewter biker rings, extra ear piercings, thin gold nose ring, dead-black hair dye. For the arty bluestocking look, wire-rimmed but oddly oblong glasses, hair pulled back in a decorative ceramic or bronze/copper barrette. For that night out on the town: killer mascara, scarlet lipstick, and a longer and thinner skirt with two or even three big slashes up to mid-thigh. In the context of this Sicilian Widow get-up, those skirt-slashes are amazingly provocative, living proof that in things erotic, less is often more.

There is also, interestingly, an older-woman Yuppie Praguélodette look, with a baggy cashmere sweater, black silk skirt, nicer and less scuffed shoes, styled hair, nail polish, and hose. Accessories: a plastic shop-

ping bag, a sturdy-but-stylish leather purse, a cellular phone.

It's a good bet that if you see a woman striding the cobbled streets of Prague who looks unbelievably picturesque and authentic – more Eastern European than the Pope, with her chin held high, ethereal Slavic cheekbones, looking very spiritual and maybe just the least little bit smug – she's a Yankee. A YAP: Young American in Prague. Real Czech women are also known to dress in high Praguélodette drag because Czech fashion designers are very hip and can do counterculture inside and out, but the classic accessories for a young Czech woman in early to mid-20s are a wedding ring, a baby carriage, and maybe a toddler.

Eva Hauserová is a Czech feminist and environmental activist. She was also, before the revolution, one of the country's better-known and more influential science-fiction writers. Before 1989, science fiction wasn't understood by the authorities any better than modems were, and therefore a lot of Czech science-fiction stories were allegorical parodies describing the utter anguish of the Czech population. Eva specialized in this.

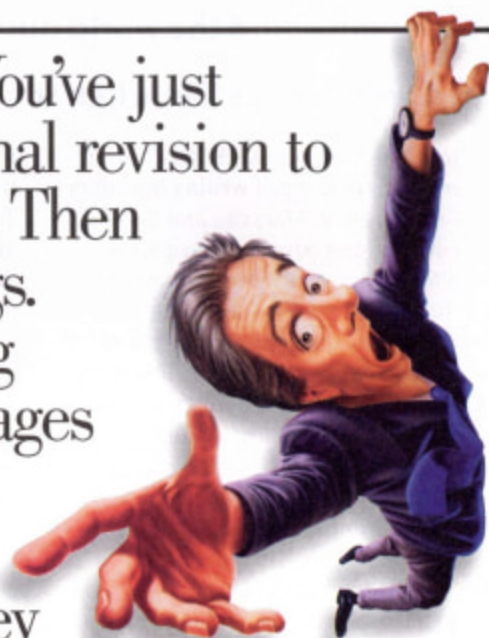
As Eva once put it, "In totalitarian times,

science fiction enabled us to speak about society much more openly and critically than the literary mainstream; it is an outstanding medium for political metaphor." She wrote gruesomely fantastic stories, often with grisly biological themes, for she was trained (like many Czechs) as a biochemist. She wrote stories and novels, did her own *samizdat* science-fiction fanzine, and later worked as an editor for the leading Czech science-fiction magazine, *Ikarié*.

Czechs are fond of fantastic writing. Kafka's work is metaphorical and fantastic, Karel Čapek and his brother Josef gave the world the word "robot," even Havel's plays have artificial intelligences and absurd invented languages with comic "scientific" properties. Marxists sometimes classed science fiction as a "degraded literature," *pokleslá literatura*, but in practice, fantastic writing was taken quite as seriously as any other sort.

Yet with the liberation of her society, Eva fell mute. Or rather, she began to campaign openly and vigorously for things she'd only hinted of in her fiction, such as environmentalism (somewhat odd and radical) and feminism (very odd indeed in a Czech context and quite the uphill struggle politically). Now she edits books on feminism, coordinates Czech women's groups, and writes tracts for an 156 ▶

It's 3:50 pm. You've just finished the final revision to the sales plan. Then the phone rings. "We're sending over 10 new pages of competitive info." Click. Good thing they lock the windows on this floor. You have to get it into the plan by the end of the day. What now?



Prague

◀ 155 environmental magazine.

To make money, Eva translates Harlequin romances. Eva has an enviable grasp of the stereotypes involved in Western romance fiction, and can whack out a translation on her PC clone in about a week. It pays far better than subversive science fiction ever did, and she'd be rolling in the korunas if she wasn't renovating her house, as everyone in Prague seems to be doing. "When I want to say that Klaus is stupid and his ideas are stupid I can say it directly!" she told me cheerily. After the revolution, she published one quite cheerful science-fiction story, and then felt completely relieved of the need to write any more science fiction.

The small, intense world of Czech publishing has been turned upside down by the revolution. The former dissidents belong to a vanished epoch and are getting old enough to discover that they have a favorite

good for your lungs. Václav Klaus openly loathes environmentalists, and has often declared that Greens are Reds in sheep's clothing who want to re-regulate the economy. There's a lot of work here for an activist of Eva's description, but here she is, a gifted Czech writer who is translating Harlequin romances. Something isn't right.

Doug Hajek has published Eva in his émigré literary magazine, *Yazzyk*. I met Hajek in a happening little downtown bar-and-gallery called Velryba (the Whale). We had lunch: a slab of fried cheese, fried potatoes, and a little dab of shredded cabbage with a slice of cucumber and tomato. And big, tall beers. Typical Czech lunch.

Yazzyk was founded in 1992 by Hajek, fellow Canadian Laura Busheikin, and Californian Tony Ozuna. "We didn't want to say that we had Havel or Škvorecký or Kundera," Hajek declared, forking up his scanty greens

to deal directly with this corner of it. I highly recommend the Michal Ajvaz piece in issue three – "Hey! This guy Ajvaz is *good!*" In the hard-hitting "Erotica, Sexuality and Gender" issue there's a hot-and-heavy love letter from the late Jana Krejcarová to Egon Bondy, circa 1962, which is such an astonishing yowl of raw feminine passion, cut with disquisitions on philosophy, that it makes one's respect for Bondy soar.

Yazzyk is published in a fairly spacious (by Prague standards) office in Blahoslavova Street, northwest Prague. The place is infested with PCs, laser printers, scanners, and a fax (one lousy phone line, unfortunately). Piloting the mouse in the back room is Aha business associate, *Yazzyk* art director, and Hajek main squeeze Veronika Bromová, 27. Veronika designs *Yazzyk*, posters, magazines, photo exhibits, CD covers, Prague tourist guidebooks, rock-band promotions, newsletters, and anything else that shows up and can be fed into her new 486.

Despite his surname, Hajek isn't Czech. Most of his ancestors are Ukrainian, and he picked up Czech by showing up in Prague and soaking it up on the spot. Doug is a very smart guy.

There are probably a lot of guys in North America who dream wistfully of kicking over the traces, flying to Prague, starting a way-art magazine that publishes cultural exotica and with-it, happening people of your own generation, while, not incidentally, starting up a flourishing personal corporation and taking up with an exotically beautiful and artistically gifted girlfriend. But Doug Hajek has actually done this stuff. It's not hype. Hajek never talks hype. He's very practical; he just does the work. And it's real. It's real like this desk is real.

Snapshots. I spent a couple of hospitable nights on the office couch of émigré Robert Horvitz (antenna@uwell.sf.ca.us), who is a media consultant for the Soros Foundation. Bob is a former graphic artist turned network expert who works to develop radio stations in Eastern Europe and frequently vanishes to sites in the former Yugoslavia with a valise full of modems. His Serbian wife, Biljana, is about to have their first child. Bob knows very well what he's doing here in Prague. Bob looks to me like a happy man.

Doug Arellanes is a graphic artist and network expert who designs computer interface graphics for Econnect, a nonprofit environmental foundation. Doug Arellanes is one of the "Santa Barbara mafia," a group of 50 or so Gen-X types from the University of Califor-

***Samizdat* is what a counterculture looks like when the forces of repression compress it as hard as a diamond.**

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easy chair. The Communist Writers' Union time-servers have stopped writing laudatory pseudo-novels about Marxism and have switched to writing advertising copy, the modern functional equivalent of their old gigs. Other fiction writers have gone into politics or private enterprise or turned to journalism. As for Czech science fiction, it's swamped by 40 years of American science fiction, previously forbidden and now smothering the Czech scene in a sticky avalanche of space opera and Tolkienesque fantasy. Some Czech writers are finding that their sales soar when they write under English-sounding pseudonyms.

Eva Hauserová is a very bright woman and she obviously has a point. Feminism has scarcely made a dent here, and large tracts of Bohemia are strip-mined or seared by acid rain. Czech life expectancy is still dropping. Prague is nasty in the winter, when fogs and temperature inversions turn it into a toxic soup of diesel fumes. The country's primary exports are cement and steel, neither very

with a will. "We want to publish new Czech writers, people the West has never heard of!" To date, there have been three issues of *Yazzyk*, which has a print run of 2,000. It's the best-known émigré magazine here, with the exception of *Trafika*, which prides itself on internationalism and publishes writers from all over the world.

Yazzyk, by contrast, printed Egon Bondy, Eva Hauserová, Jana Krejcarová, Michal Ajvaz, *et* even more obscure *alia*, plus some of Prague's North American talent. The magazine had hoped to break even, though it never has, quite. While busily cooking up issue four, Hajek teaches English and manages a design and publishing company called Aha, one of the first capitalist companies formally and legally registered in the Czech Republic. Hajek is a 27-year-old globetrotter who has been on the road for 10 years: Italy, Japan, Argentina. Now he lives in Prague and has no plans to leave.

Yazzyk may not be the best little literary magazine on the planet, but it's the best one

nia, Santa Barbara, who started *Prognosis* and work in journalism and graphics. In classic Prague serendipitous fashion, Arellanes walked into a bookstore where I was signing copies of the Czech edition of my science-fiction novel and said, "What in hell are you doing here?"

Later we had a beer at the Velryba and decamped to a cavernous cellar restaurant, where I feasted on a monster joint of roast pork. Graphics are happening here: there's *Post*, now there's *Raut*, and some of the finest typographers and book designers in the world. Arellanes just got his deft designer mitts on a PowerPC Mac, and someday he hopes to fulfill the ultimate YAP dream: Western work at a Western salary via the Internet from his rent-fixed Prague domicile, which costs him 20 bucks a month. His dream looks eminently possible to me. What else is TCP/IP for?

Jaroslav Olša works for the Czech foreign ministry. He also publishes science fiction, and his idea of a good time is getting Czech science-fiction stories published in English in India. Jaroslav used to consider it a wonderful forbidden thrill when he was able to cross the border into Poland. Since the revolution, he's been to Saudi Arabia, Lebanon, South Africa, Kenya, Indonesia, and is planning a trip to Fiji.

Jaroslav took me to the Marolda Panorama in Prague. Panoramas were the 19th century's precognitive answer to virtual reality, a 360-degree painted backdrop embedded in physical stage-setting.

Prague's Marolda Panorama was painted and set-designed in the 1890s, and a friendly payoff to the sympathetic custodian got us in after hours, entirely alone. The panorama shows the defeat of Europe's first Protestant Reformation – here, worse luck to the Czechs, in the Czech lands. It's a battle scene, where Hussite Czechs struggle, heads uplifted, against a tide of angry foreign Catholics. They lost, of course. The Czechs always lose. They haven't won a war since 1620, and they lost that one, too. But they never give up.

There are pikes and spiked maces and charging cavalry and Hussite war wagons, the western world's first mobile armor. There's blood and swords and toppling standards, and creepy, wood-mounted, primitive hand-cannon. Panoramas are a dead medium now, but 100 years ago, panoramas were enormously popular. It's very virtual inside that panorama, it's just as if you were there; but the horizons aren't real and, you're actually inside the bitter nationalist visions of some clever artist's head. The 158 ▶

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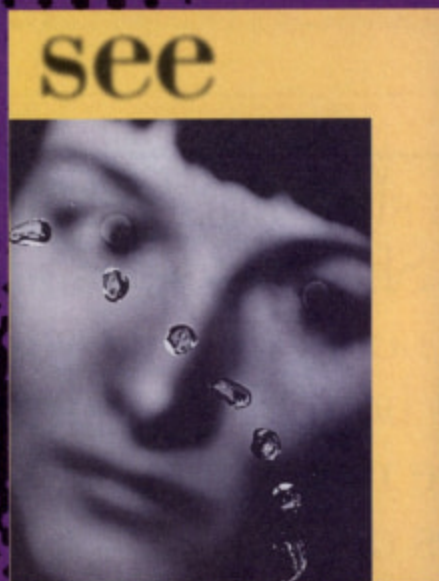
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the more you look, the more you see

Prague

◀ 157 sense of wonder and eldritch nostalgia is only accentuated by the clumsy retouching of the aging canvas.

Prague isn't all beautiful; out on the edges of town there are desolate concrete *sídlisťe*, prefab workers' barracks that will probably warp the lives of another generation. But the city center deserves its fame: Prague is one of the few European cities to avoid the 20th century's tide of annihilation. The splendid Jugendstil Art Nouveau architecture from before the first world war is so lovely it makes one conclude, almost with a sense of despair, that everything else built in this century is profoundly wrong. Maybe Prague really is Second Chance City. That's far from proven, but at least there's a chance to prove it.

Yet this is a very '90s city. Even its artistic problems are '90s artistic problems: the struggle of a bewildered and put-upon generation to speak authentically in an era whose central directive is to reduce all art and all life to an infinitely replicable commodity, to turn Kafka into a T-shirt and Havel into a carny attraction, to shrink-wrap cultures as pasteurized package-tour exotica, to make art a bogus knickknack and heritage the hottest-selling market segment of the Museum Economy.

To talk about that artistically without becoming part of it is a tough problem. But problems like that are a luxury. Without problems, art can't exist. No people, no problems, as Stalin used to say.

There'd be no problems here if this city today were what it might so easily have become, a smoldering slag-heap, littered with the radioactive second-stage casings of American nuclear missiles. I'm old enough to feel glad that I don't have that on my conscience. I'm not a YAP, I'm not young, and I'm just passing through here. But how marvelous to be an American and walk like a young god through a city that your parents were grimly prepared to annihilate. How wonderful to be an American writer in Prague, to have a perfect chance to yammer out most any damned thing that enters your head, in a city where people of genius once paid for free expression with their lives and their health and their futures and their happiness. And lost every battle, but won the war. How truly splendid that all is.

And the Czechs are even getting rich. And the beer is every bit as good as they say. And I even have a computer here.

God, I love the '90s. ■ ■ ■

Caught

◀ 127 case like this, argues John Galante of the Security Industry Association, illustrates the very real need for covert surveillance – at Tiffany's, another set of cameras that employees don't know about. That way, an inside job won't be inside enough. To Galante, this is only one argument in favor of preserving the right of employers to install hidden cameras, a right that is threatened by the legislation crafted by Williams and Simon.

Over the last few months, I have been paying attention to the cameras that watch me, compiling a mental file on their effects. I have become familiar with glass ceiling domes of wine-dark opacity, with weatherproof and mini-sub-like housings. I have learned the particular crick-necked angles, querulous and bird-like, at which cameras tilt on their mountings to peer at us.

Once you start looking, you see cameras everywhere. In a general store in a small

**World peace relies
on video: cameras are
watching weapons
facilities in Iraq.**

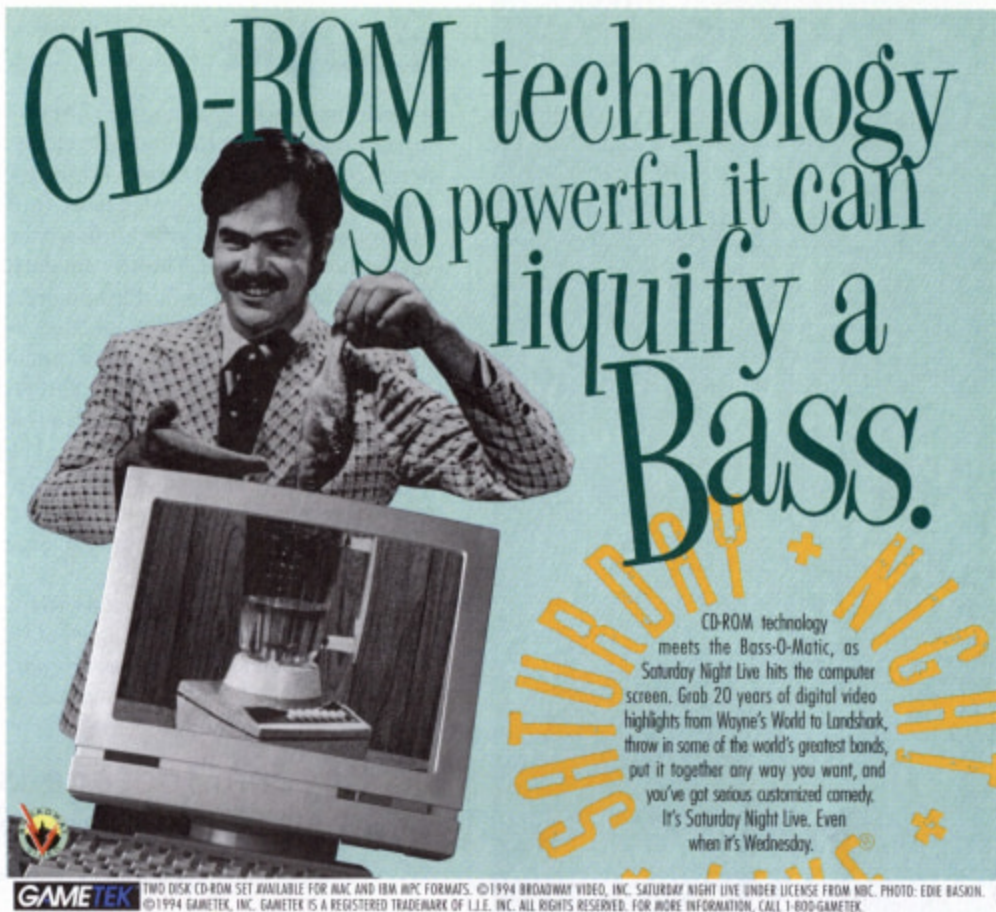
town in Western North Carolina where my great-grandfather shopped, a place with negligible crime, I discover an elegant and cunningly tiny Philips camera tucked into the corner, watching the overalls and work boots.

I notice the signs reading "surveillance being carried on for your safety." And my ears prick up at radio news stories like that of the factory workers who complained of strange-tasting coffee. They set up a hidden video camera, and, sure enough, the images revealed that the employee making the coffee was urinating into the pot.

Seccam footage has given TV news another edge over print. Such footage is a staple of tabloid TV – even the network news can rarely resist the shoot-out in the convenience store. Such video clips are the TV equivalent of the images from the '40s by the great tabloid photographer Weegee, of bleeding mob victims and tear-stained refugees from tenement fires. Now the tabloid press has to fight to keep up with tabloid TV.

Getting my coffee at the convenience store on my way to the security convention, I picked up a copy of the *New York Post*, which a few days before had printed a frame-by-

160 ▶



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Caught

◀ 159 frame sequence of a recent crime. A taxi driver named Glenn Iscoe tried to stop a robbery at the Oasis Bagel Shop on Horace Harding Expressway, in Fresh Meadows, Queens. The robber turned and killed him with a single shot to the head. The seccam got it all.

"Death of a Hero" the *Post* trumpeted, running five frames of the seccam footage, comic-book style. The language in the captions whipped up sentiment in a vain effort to convey the shock of the actual video. One caption was vintage tabloid, worth repeating in full: Frame 5: "Totally unfazed by having just snuffed out an innocent life, the ruthless urban predator steps coolly around Iscoe's body to grab the loot and flee."

But the combination of seccams and tabloids also highlights the dangers of video goofs. Several years ago, after a series of ATM robberies in New York, police matched the

number of Dunkin' Donuts stores in the Northeast were making, as a security measure, audio recordings capable of picking up customers' conversations, customer outrage forced the company to remove the systems. The long visible video cameras remained.

Ironically, the people *least* on TV may be the TV stars. They don't buy their breakfast at Dunkin' Donuts. They avoid the cameras of malls and airports, of grocery stores and department stores (don't they all have personal buyers?). They travel in limousines, not buses. They enter buildings not through the lobbies with surveillance cams, but through back halls. The bigger the star, the less the surveillance. Even figuring their hours on broadcast TV, it's safe to say that Katie Couric and Barbara Walters, Dan and Connie and Ted, are on camera less than you are.

Seeing myself on surveillance-camera monitors doesn't necessarily bother me – but then I'm not on camera at work or home. The

Seccam footage is a staple of tabloid TV – even the network news can't resist the shootout in the convenience store.

time of one assault with the videotape at the ATM in question. The cops concluded that their suspect was a taxi driver named James Hairston. Hairston woke up one morning to find the police at his door and his face on the front of the New York *Daily News*, beneath the word WANTED! But the clock had malfunctioned. Hairston, a law-abiding citizen, promptly phoned his solicitor.

Commercial security is not the only sort that depends on video surveillance – so does national security. Our hopes of world peace rely at least partially on video: video surveillance cameras are now watching potential nuclear weapons facilities in Iraq. Inside the "Mother of All Battles" engineering facility near Baghdad, a handful of security cameras, whose tapes are reviewed every few months by nuclear-control agency representatives, are supposed to keep Saddam Hussein from developing the bomb.

But at the convention, I hear rumblings that new kinds of body patterns and motion detectors are supplementing and, in some cases, supplanting video. The future of "premises control," the experts tell me, belongs to "biometrics": fingerprints, prints of retinal patterns, or voiceprints. And for some reason, audio monitoring bothers people more than video, which is soundless, like silent movies. When it was revealed that a

monitors I most often see are in the windows of those electronics shops for tourists in New York (the ones permanently broadcasting "Going-out-of-Business – Last Two Weeks!"). Seeing my face in their monitors as I pass dismays me not at all: they see me no more deeply than the tourist sees the city.

But another kind of image, oddly, seems intrusive: the video images you find at airport luggage security monitors. In a way they sum up the issue better than the real video. They are beautiful abstractions: now that false color is replacing black-and-white in the X-ray videos, soft and incidental parts of your life disappear into the colors of the technology – hues worthy of a Charles Sheeler watercolor or an Irving Penn photograph.

They show privacy as a protoplasm. Like fish that live at great depths, their bodies having evolved into transparent structures. Underwear vanishes, a sport coats leaves a mere shadow. But the hard centers of batteries and motors loom large and solid. It is an unexpected view of yourself, as though you were to look into the bathroom mirror and see – instead of your face – the contents of the medicine chest behind it.

It is as frightening as it is beautiful: a model of the bubbles in which we live, of the varying degrees of penetrability that constitute our personal effects, our files, our lives. ■ ■ ■

Debray

◀ 116 in a predictably specific direction.

It wasn't the invention of the mechanical clock that modified the medieval conception of time; monasteries needed a timekeeper for their religious rituals, so the clock became a plausible technology.

In the same way, a given technology can lead to very different effects in different mediaspheres, as the invention of printing attests. Although wood-block printing first developed in China, it did not evolve into moveable type, presumably because it was more appropriate to a calligraphic tradition.

In Europe, however, wood-block printing appears to have led almost inevitably to our Gutenberg culture of typesetting and print shop. There is no fatality about the given effects of what appears a natural advance to any specific technology.

What, in your view, is missing from the manifold debates on the history of technology development today?

What I call the jogging effect. When the automobile was industrialized, futurologists said that people would develop atrophied legs from sitting cramped in their cars all day. What happened was commuters put on Lycra shorts and started running on their lunch breaks.

Each technical step forward means a compensating step backward in our mind-sets. Islamic fundamentalists don't come from the traditional universities deeply rooted in a literary educational system; they graduate from engineering schools and technical colleges. Last century, some futurologists foresaw the end of national wars under the influence of spreading railroad lines and electrical telegraphy; others believed that industrialization would wipe out religious superstition.

In fact, an imbalance in technologies tends to provoke a corresponding refocusing on ethnic values.

France has taken much flak over GATT and its "cultural exception" clause for film production. You waged a friendly, if uncompromising, duel with the free-marketeering Peruvian writer, Mario Vargas Llosa, over what is at stake in this issue of media dominance. How does a mediologist view the high-culture-versus-pop-culture issue?

Just as the concept of biodiversity seems to be developing into a general concern for nature, so I think we should negotiate a contract for mediodiversity in a mediosphere that is continually threatened with increasing uniformity of content because of the spread of global networks.

The contrast between commer- 162 ▶

"What's this talk about Saturday Night's Seedy Prom?"

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◀ 161 cial entertainment product and cultural artwork reveals two competing world views. Commercial entertainment products meet consumer needs, whereas cultural objects create their own audiences, often against the grain of current taste.

The Nielsen ratings not only spell the demise of filmmakers such as Roberto Rossellini or John Cassavetes, they also write the coda to an essentially Enlightenment vision that puts the quality of artistic mind over the quantity of box-office matter. Simply put, movie studios like Columbia Pictures and Warner Brothers might be good for the US, but there is no reason why they will be good for humanity as a whole.

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While the neurosciences are dedicated to overcoming the inherited duality between mind and brain, mediology tries to view history by hybridizing technology and culture.

can change a kid's life. But 520 different types of cheese or wine won't, however much the studio bosses suggest that America makes movies and France sticks to gastronomy.

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The machine offered Descartes a model for thinking about the human body. It later provided British mathematician Alan Turing with a model for intelligent behavior. But machines will never be able to give the thinking process a model of thought itself, since machines are not mortal. What gives humans access to the symbolic domain of value and meaning is the fact that we die. ■ ■ ■

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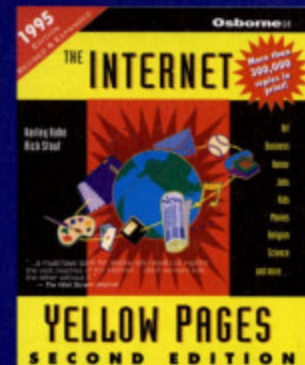
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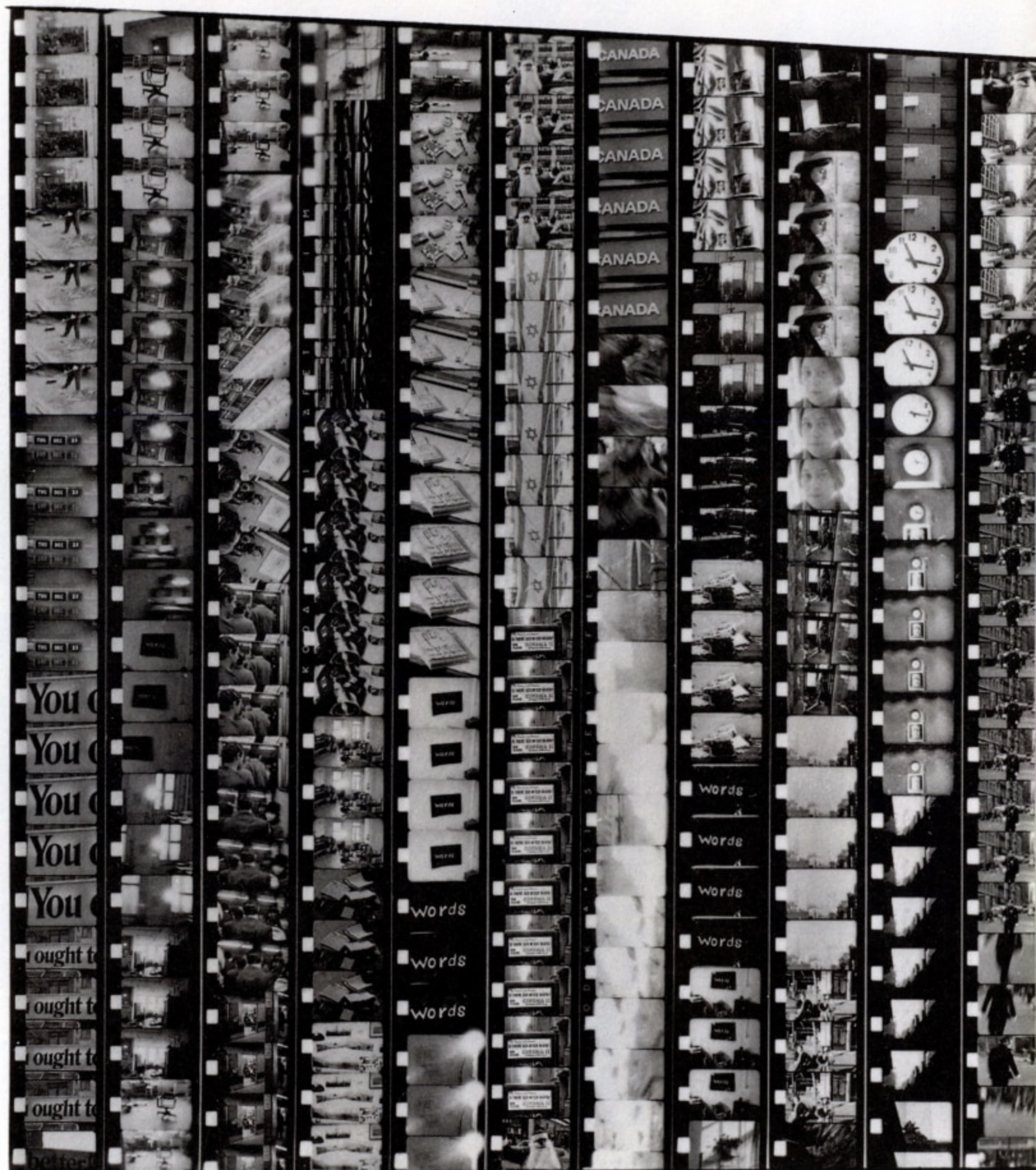


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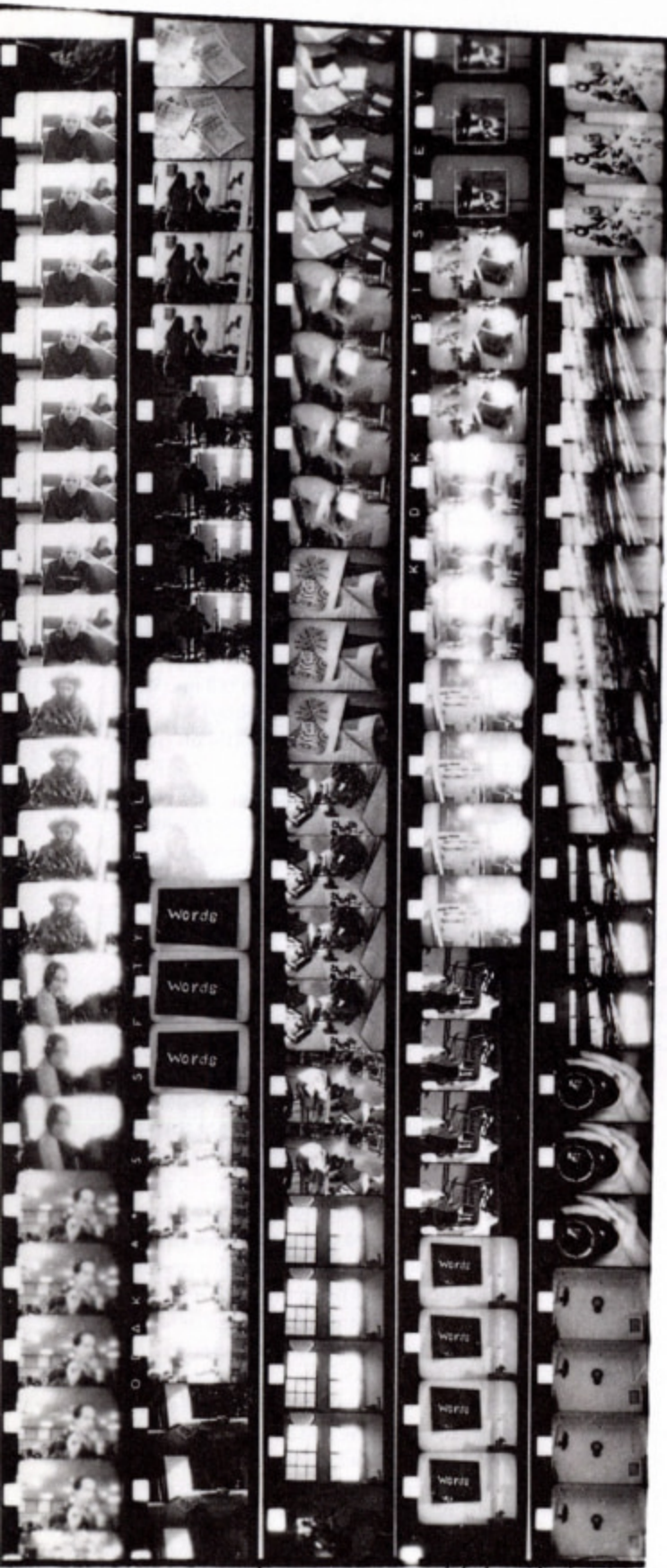
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good bye Mr Brodovitch

I'm leaving New York



December 23rd 1971 OK: Robert Frank

Exile on Pain Street

"Robert Frank: You got eyes." So wrote Jack Kerouac in his introduction to *The Americans*, a collection of Frank's spectacular work that has influenced generations of photographers.

Frank, a Swiss citizen, traveled the United States from 1954 to 1957 collecting the images that make up his best-known book. More poignant than patriotic, his stark photos clash with the clichéd images of 1950s postwar America. Frank has always pushed the bounds of photography, whether scrawling angry words across Polaroid negatives or debunking popular icons by showing them at their most vulgar. In 1972, he created the cover photography for the Rolling Stones's *Exile on Main Street*, and

he later made *Cocksucker Blues*, a controversial and rarely screened film about the Stones. Another film project, *Pull My Daisy*, chronicled the Beat poets.

When Robert Frank left New York for Nova Scotia, he sent the montage at left to Alexy Brodovitch, the legendary art director who also nurtured the talents of Richard Avedon and Irving Penn. Today, as 40 years ago, Frank continues to invent intriguing ways of expressing himself. He now has a major exhibition at the National Gallery of Art in Washington, DC. The exhibition moves to the Yokohama Museum of Art in February, and to the Kunsthaus Zürich in June. It will return to the US in November for a show at the Whitney. — Amy Howorth

Truckin'

◀ 123 warehouses, loading docks, or maintenance yards anywhere within sight of the building. Nor are there any of the company's pumpkin-orange trucks, unless you count the precisely detailed, one-third scale model of a Schneider National tractor-trailer that seems to float above the front door in the building's main lobby. President Don Schneider installed the huge model to remind all the information technicians who work in his Edge City wonderland that trucking is what their work is all about. Or, as one manager explained to me, "Even if you spend your days programming computers, around here we still want you to think of yourself as a trucker."

The core of Schneider's headquarters is dominated by the company's command center – a sprawling, 1-acre atrium called the Customer Service Floor that is jammed with computer terminals and populated around-the-clock by swarms of Schneider employees. Looking vaguely like the trading

Bay receive updated information about vehicle position, load status, and drivers' behind-the-wheel hours for each truck in the fleet. These field updates are then fed into the terminals on the Customer Service Floor, which match up available drivers with available loads. The computer can do this by choosing from a variety of optimization patterns. It can figure out which drivers are available to cover a maximum number of miles with a minimum of empty time. It can figure out which drivers are soon due for some time off, and set them up for an eventual return trip home. Or it can assign loads to drivers that will take them home right away. Or it can set up a "relay" in which two drivers meet at some designated midpoint, switch trailers, then return to their original starting places. All this in the interests of making sure that everyone – truckers and customers alike – stays happy.

Or at least pacified.

Ralph and I had picked up the load in Oxnard, and we were heading back up north, this time carrying 780 cases of aloe-

other eye to eye – trading stories, laughing a lot, talking about religion, and even engaging in a heated argument about gun control. (The journalist in favor, the trucker vehemently against.) I knew that Ralph was both shrewd and practical, but his obvious pride and independence made it clear that he was no company yes man. And for that reason alone I found it hard to understand why he nonchalantly embraced a communications and vehicle tracking system that so palpably encroached on his autonomy.

The squall passed, and the cab filled with light as the sun fell low on the horizon. I decided to ask Ralph what he'd wanted to be when he was growing up.

He told me he'd wanted to be a cowboy. He said that at about the same time his dad taught him to drive a truck, he also learned to ride bulls and break wild horses. He added that he'd competed in rodeos from the time he was 14 right up until his medical discharge from the Marine Corps.

It struck me that Ralph was the real thing. Not just a pop-culture reinvention of the cowboy myth, nor some misfit in boots who fancies himself a badass, but the genuine article. And so I said, "Well, Ralph, then tell me: What does it really mean to be a cowboy?"

The question caught him a little off guard, but he rolled with it.

"Being a cowboy is a lifestyle," he began. "The way people talk about cowboys, and what cowboys are really all about are two different things. The real cowboys were people who did what they were told, worked hard, and did it all for not much money. It's something they did for the freedom. It's about not knowing where your next shower will be, but doing a job and doing it right."

There was a pause.

"It's a lot like being a truck driver. Someone may tell you where you need to go, but you decide how you're going to get there, where you want to eat, and when you want to stop. There will always be truckers, and truckers are always going to act like truckers. Half of them are going to follow the rules, and half of them are going to pretend they're outlaws. It's been that way ever since we were driving teams of 20 mules across the prairie. You make your own choices. Still."

With that, we were quiet again. A fiery red sunset burned in the west. Miles of unbending American highway unrolled beneath us. The diesel engine gurgled at a steady roar, and the display panel on the OmniTRACS unit glowed a luminescent green. But it was all right. Everything was all right. I forgot about Big Brother. ■ ■ ■

**"Being a cowboy is a lifestyle," says Lowrey.
"It's a lot like being a trucker. Someone may
tell you where to go, but you make your
own choices. Still."**

floor of the New York Stock Exchange – without all the paper – the Customer Service Floor is where the job of matching drivers up with loads takes place. In Schneider-speak, the process is referred to as "flow management." That means trying to keep a highly dynamic system in a constant state of balance: most trucks should be full, some empty trucks should be on hand near locations where demand is anticipated, and each driver should get home at least once every 10 days to spend time with his or her family. In a sense, "flow management" is like one of those headache-inducing logic problems in which Sally needs to sit next to Jeff, Jeff wants to sit next to Judy, Judy can't sit next to Sally, etc. Only imagine that there are 9,000 people seated at the table, and that the table is constantly in motion.

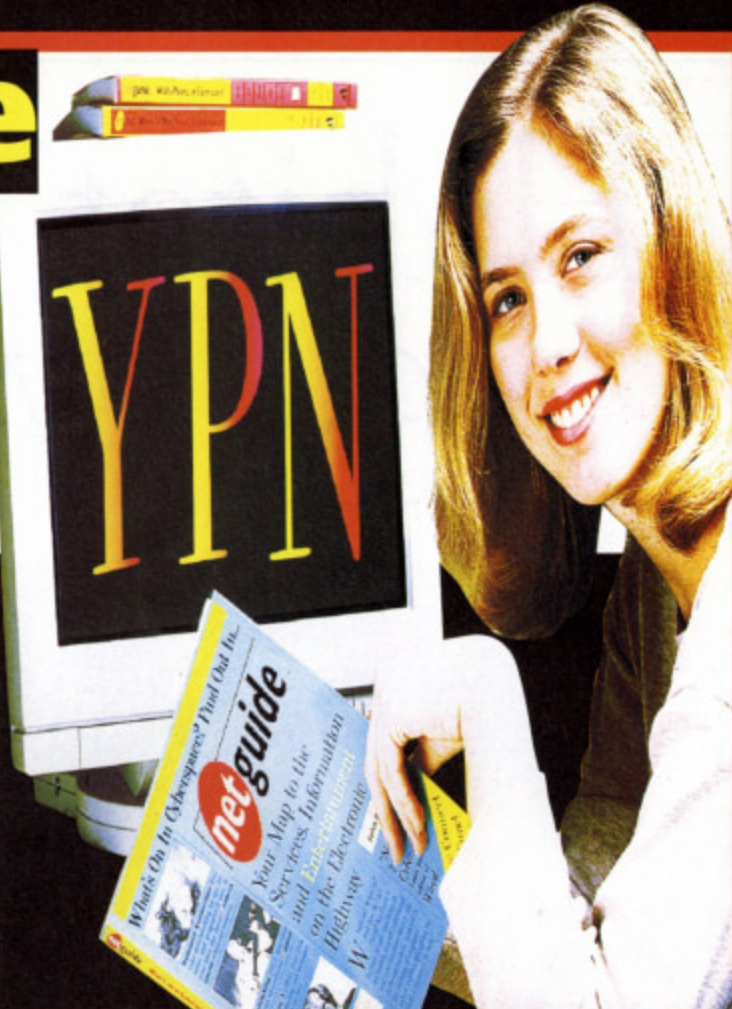
Much of Schneider National's computer power is geared toward keeping these flows in balance, and the OmniTRACS units installed in Schneider's trucks are vital nodes in the Orange On-Time Machine's neural net. Every two hours, the mainframes in Green

impregnated, two-ply toilet paper. Cruising along I-5, we began climbing "The Grapevine," a steep mountain range that separates the Los Angeles basin from the scorched flatlands of California's Central Valley. Because of our light load, we were able to climb the grade at a steady clip, eventually moving into the left lane to overtake a blue Kenworth. As we passed, I looked over at the driver of the slower truck, who seemed visibly startled. Smoke began pouring from his exhaust stacks, and then he was ahead of us, blocking Ralph's attempt to pass. Ralph was unfazed, having seen this reaction before. "He just can't stand the thought of being passed by a Schneider National truck," Ralph laughed. "But that's OK. I probably make more than he does."

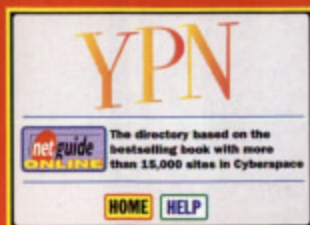
The Central Valley opened up beneath us, and we pulled into a truck stop to refill Ralph's travel mug with coffee and refill the truck's fuel tanks with diesel. When we got back on the road, Ralph and I sat in meditative silence as we plowed our way through a thunder squall. We had come to see each

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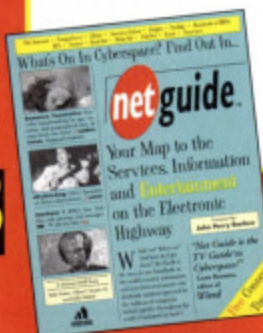
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Sim Heads

◀ 130 real," Baron says. The gaming publications were critical, at first, sniping, *This isn't an adventure, it's a job*. But authenticity won the battle. About 7,000 people play *Air Warrior* in the US alone. And hundreds of thousands of people all over the world play all sorts of different kinds of elaborate flight sim games.

No one seems to know how flight sim got

We've been shot down. We're back in the "conference room" for the debriefing. We're a dead but chatty bunch of flyers. And for a dead guy, I'm feeling stoked.

from its original military application to games – or at least not precisely. Baron thinks it's an example of simultaneous development, with gamers learning from military and vice versa. *Mustang* on the Mac was one of the first, in the early '80s, and the military has incorporated elements of it in its own training. Spectrum HoloByte had a deal to develop tabletop flight sim for the military and applied some of the technology to games.

Falcon, which uses modern aircraft, is one of the top PC flight-sim games. But the *Falcon*'s "flight model" – the overall profile of realism – is not as authentic as some.

How authentic are the players?

"You get a lot of swell-headed jerks who behave the way they think real fighter pilots behave, who taunt you," Baron says. But a lot of friendships are formed in the squadrons too, and there are admirable people to befriend out there in the digital skies. "You really have to have both talent and dedication to reach the highest levels of this game," Baron says.

You want to trace the arc? Just braille the high points:

In the early '80s there was *Mustang*. Primitive stick-figure stuff, full of bugs. The original *Falcon* came about as a direct graft from Spectrum HoloByte's military flight-sim work. There was Accolade's *Ace of Aces*; then around '89, quality jumped with... (Am I sounding like I know shit about this? I'm no sim-head. But I can feel the pull. I shall resist. But boys, I understand. I too would like to hunt and kill.)

It's accelerated evolution: in a remarkably short time the games developed to higher rez, more color, sharper graphics, faster response, more sound, and greater authenticity. Still, most games, like *Falcon* and *Air Warrior*, have limited realism in the landscape and action

parts of the visual; the image tends to be a little abstract, under-textured, geometrical. But it's real enough so you can create the rest of the scene in your head if you have a little imagination. The views of the cockpit and the exterior of one's own plane can be quite elaborately detailed, and the plane's response – the most important element for many players – is ever more acute.

Numerous World War I air-combat sims came in 1990: *Blue Max* from Three-Sixty

Pacific, including both the dogfighting mode and a strategy game in which you plot sorties; MicroProse's *Knights of the Sky*, which broke the modem barrier; and *Red Baron* from Dynamix, which was more technically accurate (a critical factor).

As the games came, they progressed through 20th-century air-combat history, with Lucasfilm Games bringing out *Battlehawks 1942*, simulating four air battles from the Pacific and containing more than 40 missions. A year later Lucasfilm brought out *Their Finest Hour: The Battle of Britain*. It was a huge success. And the company didn't overlook the average air-combat nut's fascination with the Luftwaffe, delivering *Secret Weapons of the Luftwaffe*, as well.

(You get the impression, hanging with sim heads, that some of them would cheerfully take a ride back in time and sign up for the Luftwaffe, given the chance. Not that they're Nazis – they just love the planes, the uniforms, the workmanship, and perhaps the Luftwaffe's grim implacability. It's the very apotheosis of the modern human's hunting instinct... *I vill go und I vill kill fur mein Führer*.)

MicroProse brought out its own high quality World War II sims. In 1992, Dynamix's *Aces of the Pacific* allowed you a variety of missions and made it possible to be a Japanese or American pilot; maybe because of its unusually realistic dogfighting graphics it was a bestseller.

Skipping the Korean combat and going right to Vietnam, Three-Sixty Pacific brought out *Thunder Ridge*, in which you basically bomb the living hell out of the Vietnamese. Lovely. A new extreme in symbolic digital dehumanization.

Spectrum HoloByte's *Flight of the Intruder* put players in A-6 Intruders and F-4 Phantoms. It featured polygon graphics 171 ▶

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Sim Heads

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Air-combat sim is rockin' out today. Falcon's updated versions feature detailed cockpit instrumentation, and *all of it means something*. Then there's MicroProse's Strike Eagle sequels and its *F-19 Stealth Fighter*.

One of the best introductory flight-sim

"Are you going to cast us as paramilitary wannabes, drinking and muttering racist and sexist comments while glorifying death and military hardware?"

games is Electronic Arts's *Chuck Yeager's Air Combat*. Your instruction comes from General Yeager himself. (I wonder what ol' Chuck really thinks about this stuff? He probably tries not to think about it and just kisses those royalties checks.)

In LucasArts's *X-Wing*, we jump into the future with startlingly detailed flight sim in outer space.

You wanna play this stuff? Are you insanely driven? The learning curve is steep. But *Wired* talked me into this. So me, poor dimwitted right-brained John Shirley, I get out *Falcon 3.0*. I'm supposed to interpret this head-up display and cockpit with its G-force indicator, flight-path marker, pitch ladder, altitude scale, air-speed scale, HUD mode indicator, RPM indicator, five-mile radar ranging scale, distance to way-point indicator, altitude indicator, flare and chaff indicators, AOA indicator. Where's my male hardware fetishism when I need it? It's not kicking in.

Dip into a flight-sim specialty magazine, *Intercept*: "The MiG's weaknesses are the lack of FBW control (which increases your workload), the lack of a G limiter... Strengths are its two RD-33 turbofans (each rated at 11,240 pounds of thrust at full military power)... its 'RST system which doesn't register on the target's TWI, the HMS sighting system."

Who gets this far *into* this stuff?

Well, Neil Johnston, for one.

Neil Johnston, an early-middle-aged guy who works at Spectrum HoloByte, overseeing flight-sim games, has been in the flight-sim scene for 20 years. He used to do SubLogic flight sim on Apple II as a lad. He used to go into the computer store and play till the salesmen kicked him out. He was in Airforce Jr. ROTC, but couldn't fly because his eyes were so bad he'd couldn't hit the broad side of a barnstorm. He lived up there anyway, in his

imagination. He was into books and movies about air war. Into, as he told me over lunch, "the whole 'Knights of the Air' mythos."

He figures there are from 80,000 to 150,000 "hard-core" flight-sim nuts. But *Falcon* has sold 700,000 copies to wannabes. There'd be more, but it costs between 600 and 800 bucks in online time to get good and involved.

It's the appeal of 3-D computer space; it's a love of flying, a love of competition – that one especially – and under the table, Johnston

allows, it's all based on "I'm tougher than you" posturing. Fantasy. *Hunting instinct*.

And, Johnston tells me, a chance to "relax in rowdyism" – highly technical, gearhead, wirehead rowdyism – is an important factor. Not just anybody's qualified. You don't need to be a pilot – most sim heads aren't – but you do need a "visceral understanding of the physics of flight."

Do women get into it? Not many, Johnston says. He figures that women go in for certain games, like *Tetris*, where you are putting something together, gathering, repairing.

Men go for hunting something down and blowing it apart.

That, of course, is the basic payoff in lots of kill games, but flight sim buries its primeval engines of motivation under layers of "flight modeling" authenticity and a sort of psychological actualizing of military trivia.

The youngest players, says Johnston, who's done his market research, tend to be grad students blowing off steam; the largest group of players are men in their 30s and 40s, with significant discretionary income. Is this the game of prosperous Young Republicans?

As for that, Johnston recommends I check out the 510th Tactical Fighter Wing.

"Are you going to cast us as paramilitary wannabes, drinking and muttering racist and sexist comments while glorifying death and military hardware?" one guy in the 510th jokingly asks. Only he's not entirely joking; he's a little nervous about being ridiculed.

The 510th Tactical Fighter Wing, based in the San Francisco Bay area, is a flight-sim user group that gets together *physically* and cyberspatially to go on missions.

Bryce Whitlock, a professional guy from the suburbs, Weber jockey and garage scout, is seriously into the 510th – hell, he was its organizer. Sometimes the 510th plays 172▶

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Sim Heads

◀ 171 together online, at home, with a headset-mike telephone connection and ThrustMaster rudder control system. These guys go on some serious missions together. They're up there in person – in a way.

Or in, at least, the Dunfey Hotel, in San Mateo, California. The place looks like a simulated Germanic castle, a cheaper Disneyland version of one of those World War II-

The beer flows as liberally as the jokes, but at certain moments you can see through the screen of humor to see how seriously they take it.

movie Nazi-commandeered mountain mansions assaulted by Richard Burton and Clint Eastwood. Maybe the Dunfey was unconsciously chosen for its Luftwaffe resonance.

Whitlock and the other club members have rented a slightly undersized conference room at the Dunfey, where they've set up a dozen or so PCs, all of them somehow wired together. A few of them are Pentiums, and the lads joke that they have so much hard drive, their electromagnetics will make you sterile. When I first get there most everything is set up but no one is quite off the ground. (One guy with a Pentium has a "Secret Weapons of the Luftwaffe" mousepad.)

A few of them are pilots, but most of them have sublimated their flying lust into flight sim. They're all short-haired, middle-class white guys, except the treasurer, who is black. A few are young, but most are in their 30s or early 40s. (That must have something to do with the flight-sim equation: it's a restless age for a man. He's not sure he's bringing home the kill along with the paycheck.)

"Basically we're a bunch of grown men –" one begins.

"– trying to get away from our wives!" another breaks in.

"– playing with toys," finishes the first.

You already knew that. And you can imagine it just as it is: they're constantly wise-cracking, as they set up and play. "Only we can fly an F-16 with a beer in one hand!" The beer flows as liberally as the jokes, but at certain moments you can see through the screen of humor to see how seriously they take it – you can see it in their eyes, in the dewy foreheads and the hunched shoulders and bared teeth as they struggle to escape enemy fire and to drop bombs. . . . And you can see it in the facts, as you consider how much time all this takes out of their lives. They'll be here all day today – and that's nothing compared to the weekly PC time at

home. How many flight-sim widows are twitching away at *Tetris*, out there – or in some Holiday Inn with the grocery boy – while their husbands are grappling with joysticks and straddling digital airplanes?

To one side, half the wall is covered with an enormous pilot's chart. An authentic Tactical Pilotage Chart for the area of the Middle East where today's air/ground battles will be fought. Most of the lines on the chart, under its mylar sheath with more lines newly

penned on it, are utterly arcane to me.

It takes four hours to really get this mission off the ground today.

How do we determine who gets which plane?

I dunno.

And here's official aeronautic phraseology, from one pilot to another in the 510th, on a trial mission: "Hey, whatcha do that for?"

The 510th has been going for a couple of years. They're already bored with their basic flight-sim tool, the *Falcon 3.0*, and looking for variations. Three years, they tell me, is old for a game. They play *Falcon* because it's a "network" game they can all play together, but it's basically outmoded as flight sim. And bugs in the software make it go down at least 20 percent of the time on network.

This time, they've edited the game with a "special software" to make it possible for them to introduce more elements from outside the normal programming. The uncertainty is half the fun, and the purveyors of uncertainty are two guys – The Generals – who are in charge of the battle design. One of these is an intellectual bear of a guy, name of DiRicco. The other is Martin "Moggy" Morris, a slender, detail-oriented Brit who used to work on the Rolls Royce Harrier engines. Not a pilot, he admits to me he'd probably get airsick in a real fighter plane.

"Set-up for the mission is the hardest part," Whitlock explains sheepishly, as set-up goes on and on, adding that much of it is incurred by the program itself. In charge of the main-frame that sets up the missions and all its dangers for the others, the generals are dressed in pilot's jumpsuits replete with 510th patches. They're sending the fighters, at the rows of PCs crammed into the little room, on a mission to rescue Israel from the Warsaw Pact, some arm of which is apparently Jordan, Egypt, and Syria moving against the Jewish homeland. On the way Kuwait City

has to be taken back – then they must move against Iraqi and Iranian tank positions on the ground (never mind the improbability of Iran and Iraq working together or Egypt working with any of these people against Israel. . . .) The 510th is attacking tanks and installations, attacking ground troops, flying against Migs that support tanks.

Strange thing is, Moggy and DiRicco (like a couple of names from yet another World War II movie) are playing both the Allies' generals on this mission *and* their enemies. They're sending in the bad guys as well as the good guys. "We may slip them some bad intelligence too – they don't know," Moggy tells me with a wink.

Compare it to the *Dungeon Master* in *Dungeons & Dragons*, they suggest (I've never played D&D but all these flight-sim guys seem to know it). Like the *Dungeon Master*, the generals create a fun flight scenario.

"These marked-off zones," DiRicco tells me, indicating the map, "are actual kill zones in the game and as they fly over them we activate those kill zones. The guys have to be smart enough to figure out what they want to go around and what they don't."

The generals have the power to decide what planes you get to go up in – and since each plane has its distinctive simulated capabilities, that's critical. The F-16 is the standard. The most popular one after that is the F15, a "multirole" aircraft. The ease of flying in the virtual world of the game corresponds to how easy the plane is to fly in real life; the British Tornados are nimble but only carry 12 bombs. If you're in a F-117, it flies "like a pig" but carries five times as many bombs.

The room is getting hot and muggy as the mission gets seriously underway. They're all wearing headsets, working with elaborate joysticks; there are special sound effects on the headsets, different squawks for different radar configurations, incoming fire, radio com, "lock noises" to warn when friend or foe has locked onto you.

Some of the 510th are going on a SEAD (Suppress Enemy Air Defense) mission, hunting SAMs (Surface-to-Air Missiles). They're going to protect their compatriots who've gone on bombing runs.

Follow me ... something over here ... I'm heading 151 ... don't forget you have to be under 300 knots ... who's locking me?! I'm locking someone!

Getting locked on by a friendly can be a problem – Moggy tells me about a real-life case, where a Mig-29 locked on one of his own planes, and his cannon was on "auto" and BOOOM! Same thing can happen in the game, if you're not careful.

Sim Heads

We believe there's SAM activity in this area so be careful ... I'm gonna climb to 12,000 feet ... Shit, I just got pegged by a Triple A ... we're getting hammered, we're getting hammered! ... you got any more pretzels?

At the debriefing, Whitlock shakes his head. "It's amazing how much we simulate real life without knowing it till later...."

At home, many of the boys of the 510th have ThrustMaster "home cockpits." This is how the ThrustMaster brochure describes them: "Scaled to duplicate the structure of a real fighter jet, you'll feel the excitement of battle like never before. Why play games when you can experience reality?"

The Basic Cockpit structure - something you climb into like one of those elaborate video-arcade games - is made of "medium density fiber board and shipped ready to assemble." The external shell is fiberglass with "appropriate decals." The basic unit costs \$695; the switch kit and controller is another \$449; the external shell, boys, is an ass-kickin' \$975.

Or you could just go to Fightertown.

You'll find it in a big, big old hangarlike build-

ing in Lake Forest, California, south of LA. Fightertown may be the current apex of flight-sim experience. This is as real as it gets so far.

Inside the building, past the cashier and Tactical Planning room and the office and The Officers Club (restaurant and bar), the glass doors take you into the hangars, where you find startlingly realistic, lifesize fiberglass and metal cockpits, detailed and cherished out to look like the planes and complete with, in some cases, the sleek nose of the

flying a jet. He joined the Marines, but because of his less-than-perfect vision was unable to pursue his dream of piloting a jet. So now he does it virtually. (There are a lot of myopic top guns flying aviation cyberspace.)

Fightertown was grown from a bean. But the place is making money now: they're planning on building another in Santa Monica.

They use something called Fighternet to set up for local networking missions - they're waiting for better phone transmissions and the

You got to "think in 3-D."

You got to control the plane's center of gravity.

Drive a car, it's only 2-D travel; fly a plane, it's 3-D.

plane and a canopy that closes over your head. Most Fightertown aficionados wear helmets and flight suits with patches. Typically, they come in with dark aviator glasses and shiny black shoes. There's a manly locker room to change in.

A former Marine pilot and Pac fleet officer, Gary "Six Gun" Woods runs the place, along with Dave Kinney, the CEO, also a former Marine. Kinney grew up without parents from age 14, lived in a basement through high school, getting through by dreaming of

existence of other sites to really realize the remote network gaming potential. In the meantime, you can climb into the state-of-the-art simulated cockpits here at Fightertown.

Fightertown is always upgrading software. And the stuff is painfully sophisticated, depending on your level of mission. I'm able to go on the first level, the toddler mission - but there are people who can pass through 11 "gates" of flight tests to qualify for a full network mission with a squadron. Takes months of training to go on a squadron 174 ▶

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Sim Heads

◀ 173 around here – maybe a year or two.

Even so, the place is user-friendly enough that even a right-brain dimwit like me can fly a solo mission. And I get a major buzz doing it. For the lower levels of the experience – which were impressively real to me – Kinney and friends wanted to create something that was as fun as it was authentic. "We wanted to keep an eye on the experience you're trying

Most aficionados wear helmets and flight suits with patches. They come in with dark aviator glasses and shiny black shoes. There's a manly locker room to change in.

to achieve and not get lost in the distractions of hardware," Kinney says. The hardware should enhance, not distract.

And don't make a big deal of crashes. If they crash, get 'em up in the air again.

The Fightertown simulators are sleek and sexier looking than military simulators, with their glimmering noses and their bubble cockpits. In the dimly lit room, their lines stream into the shadows. You almost see the rest of the plane there, ready to take to the air and kick some Migs in the teeth.

What did I just say? What's happening?

Am I becoming ... a flight-sim head?

Anybody got a number for the 12-step group?

Someone stop me.

They strap me into an F-117 Stealth fighter sim, state-of-the-art, with moveable cockpit. Just putting on the vest, the straps, the realistic helmet with working headset, and lowering the hatch so I'm snug in my own little world of military symbolism, that alone gets me off. *Now* the fetishism kicks in.

They gave me a video briefing, showing me how to control the stick by looking at the heads-up display, moving "the diamond" on the screen. You got to "think in 3-D." You got to control the center of gravity of the plane, it seems. Drive a car, it's only two-dimensional travel; fly a plane, it's three-dimensional. You don't turn a corner, you become a corner – the whole plane must change its axis in space for you to turn and remain in control. I find if I pull back and to the side as I turn, center the guidance diamond as I'm told, don't jerk the stick, don't think about it too much, and rely on some mysterious inner wiring that seems to be there in my head, I can do it. *I'm flying!*

Specifically, I'm taking off from an aircraft carrier. And I've got the best cockpit in the place – it *moves* physically, in amazing coher-

ence with what's happening on the flight-sim screen in front of me. The response of cockpit motion to image is remarkably refined. This is Fightertown's own proprietary platform.

There's all kinds of techy-tacky stuff I'm required to do in the cockpit, to give me a feeling of real interaction with the hardware: I've got to lower my tailhook when I'm landing, I've got to engage and disengage radar, release speed brakes, move flaps up and down, landing gear down for approach to

carrier, throw this switch and that ... and best of all, I've got to talk to the tower on my headset. They have a tower where there's a guy who sees what I see on my screen, and he's guiding me, telling me how to take off and land, bring my nose up, go to heading 151 (going to headings digitally is a very authentic feeling and inexplicably exciting), increase altitude, reduce speed to 350 knots, report in.

Somehow voice contact with the tower closes the circle of illusion. There's a jet engine sound too, and you can almost smell the fuel.

I was pretty good at flying, but not so good at firing missiles at ground targets. That requires a little more 3-D than I've got, because the process, here, is a lot more authentic than on, say, Sega's *Tomcat Alley*. (The latter is, though, maybe the best introductory game for those who want the flight-sim feel but don't want to climb too much learning curve.)

Getting into position to fire the missile, I tended to overmove the stick because ... because ... because of the kill excitement, I guess. I got all tense with it.

Iron Maiden's lead singer loves this place, I'm told. And as I get out of the cockpit, adrenaline still singing, I seem to hear an old Blue Oyster Cult song, "ME-262" about a German fighter plane going up to shoot down English bombers headed for Berlin: *These bombers are ripe ... like some heavy metal fruit ... my great silver slugs are eager to feed ... I can't fail, no not now ... For if these Englishmen live then I might die.*

If they live, then I might die....

There's no way I'm going to go to a flight school; the learning curve, for me, is too steep. Haven't got the time, Holmes.

But I'll be back here, to Fightertown, all right. It wasn't just the sense of having a living weapon under my hands....

I really feel like I flew.

I tell you, I flew! ■ ■ ■

Colophon

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Message 19:
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From: Nicholas Negroponte
<nicholas@media.mit.edu>
To: Louis Rossetto <lr@wired.com>
Subject:

Bits and Atoms

The \$400 Limit Applies to Atoms Only

When returning from abroad, you must complete a customs declaration form. But have you ever declared the value of the bits you acquired while traveling? Have customs officers inquired whether you have a diskette that is worth hundreds of thousands of dollars? No. To them, the value of any diskette is the same – full or empty – only a few dollars, or the value of the atoms.

I recently visited the headquarters of one of the United States's top five integrated-circuit manufacturers. I was asked to sign in and, in the process, was asked whether I had a laptop computer with me. Of course I did. The receptionist asked for the model, serial number, and the computer's value. "Roughly US\$1 to \$2 million," I said. "Oh, that cannot be, sir," she replied. "What do you mean? Let me see it."

Thomas Jefferson never considered that every citizen could enter every library and borrow every book simultaneously, with a keystroke, not a hike. Library atoms become library bits and are potentially accessible to anyone on the Net.

I showed her my old PowerBook (whose PowerPlate makes it an impressive 4 inches thick), and she estimated its value at \$2,000. She wrote down that amount and I was allowed to enter.

Our mind-set about value is driven by atoms. The General Agreement on Tariffs and Trade is about atoms. Even new movies and music are shipped as atoms. Companies declare their atoms on a balance sheet and depreciate them according to rigorous schedules. But their bits, often far more valuable, do not appear. Strange.

Atoms Are Judged Less Greene than Bits

When Judge Harold Greene broke up AT&T in 1983, he told the newly created regional Bell operating companies that they could not be in the information business. Who did he think he was fooling? The seven sisters were already in the information business and doing just fine, thank you. Their largest margins were (and still are) from the Yellow Pages, which they have sold at great profit. Judge Greene, sir, the companies are and always have been in the information

industry. What are you talking about?

What the judge is saying is that the companies have every right to kill thousands of trees, to litter our homes, and to fill garbage sites with their information business, as long as this information is in the form of atoms – paper hurled over the transom. But as soon as the companies deliver the exact same information with no-deposit, no-return, environmentally friendly bits, they have broken the law.

Doesn't that sound screwy? Was anyone thinking about the meaning of "being digital" during the time that AT&T was being disassembled? I fear not.

Pay per View

During a speech I gave at a recent meeting of shopping center owners, I tried to explain that a



company's move into the digital future would be at a speed proportionate to the conversion of its atoms to bits. I used videocassette rental as an example, since these atoms could become bits very easily.

It happened that Wayne Huizenga, Blockbuster's former chairman, was the lunch speaker. He defended his stock by saying, "Professor Negroponte is wrong." His argument was based largely on the fact that pay-per-view TV has not worked because it commands such a small piece of the market. By contrast, Blockbuster can pull Hollywood around by the nose, because video stores provide 50 percent of Hollywood's revenues and 60 percent of its profits.

I thought about Huizenga's remark and realized that this extraordinary entrepreneur did not understand the difference between bits and atoms. His atoms – videocassettes – prove that video-on-demand will work. Videocassettes are pay-per-view TV. The only difference is that in his business he can draw as much as one-third of the profits from late fees.

Library of the Future

Thomas Jefferson introduced public libraries as a fundamental American right. What this forefather never considered was that every citizen could enter every library and borrow every book simultaneously, with a keystroke, not a hike. All of a sudden, those library atoms become library bits and are potentially accessible to anyone on the Net. This is not what Jefferson imagined. This is not what authors imagine. Worst of all, this is not what publishers imagine.

The problem is simple. When information is embodied in atoms, there is a need for all sorts of industrial-age means and huge corporations for delivery. But suddenly, when the focus shifts to bits, the traditional big guys are no longer needed. Do-it-yourself publishing on the Internet makes sense. It does not for paper copy.

Markoff-on-Production

It was through *The New York Times* that I came to know and enjoy the writing of computer and communications business reporter John Markoff. Without *The New York Times*, I probably would not have been introduced to him. However, now it would be far easier for me to collect his new stories automatically and drop them into my personal newspaper or suggested reading file. I would be willing to pay Markoff 5 cents for each of his new pieces.

If one-fiftieth of the 1995 Internet population subscribed to this idea, and Markoff wrote 20 stories a year, he would earn \$1 million, which I am prepared to guess is more than *The New York Times* pays him. If you think one-fiftieth is too large a percentage, then wait awhile. Once someone is established, the added value of a distributor becomes less and less in a digital world.

The distribution and movement of bits is much easier than atoms. But delivery is only part of the issue. A media company is, among other things, a talent scout, and its distribution channels, bits or atoms, provide a test bed for public opinion. But after a certain point, the author may not need this forum. In the digital age, *Wired* authors can sell their stories direct and make more money, once they are discovered.

While this does not work today, it will work very well, very soon – when "being digital" becomes the norm.

Next Issue: Being Digital

"FLYING TOASTERS"



I'm in a boardroom the size of a **small country** surrounded by every guy I've ever competed with since junior high all in the same blue suit,

nice tie and **shiny shoes** listening to a guy with a Napoleon complex  tell us the



first right proposal gets the business and

something like half the property rights to

Central America. **Great.** Countless portables are lined up on the table and everybody's watching **flying toasters**



and taking notes. I pop in the Motorola

Power Series™ modem Diane gave me this morning. By the time this Little Corporal throws his final glare **I've sent the specs.**

As the suits file out, our proposal slides in.

Right on the screen.

I swivel the portable, wait, and interpret his grunt as positive.

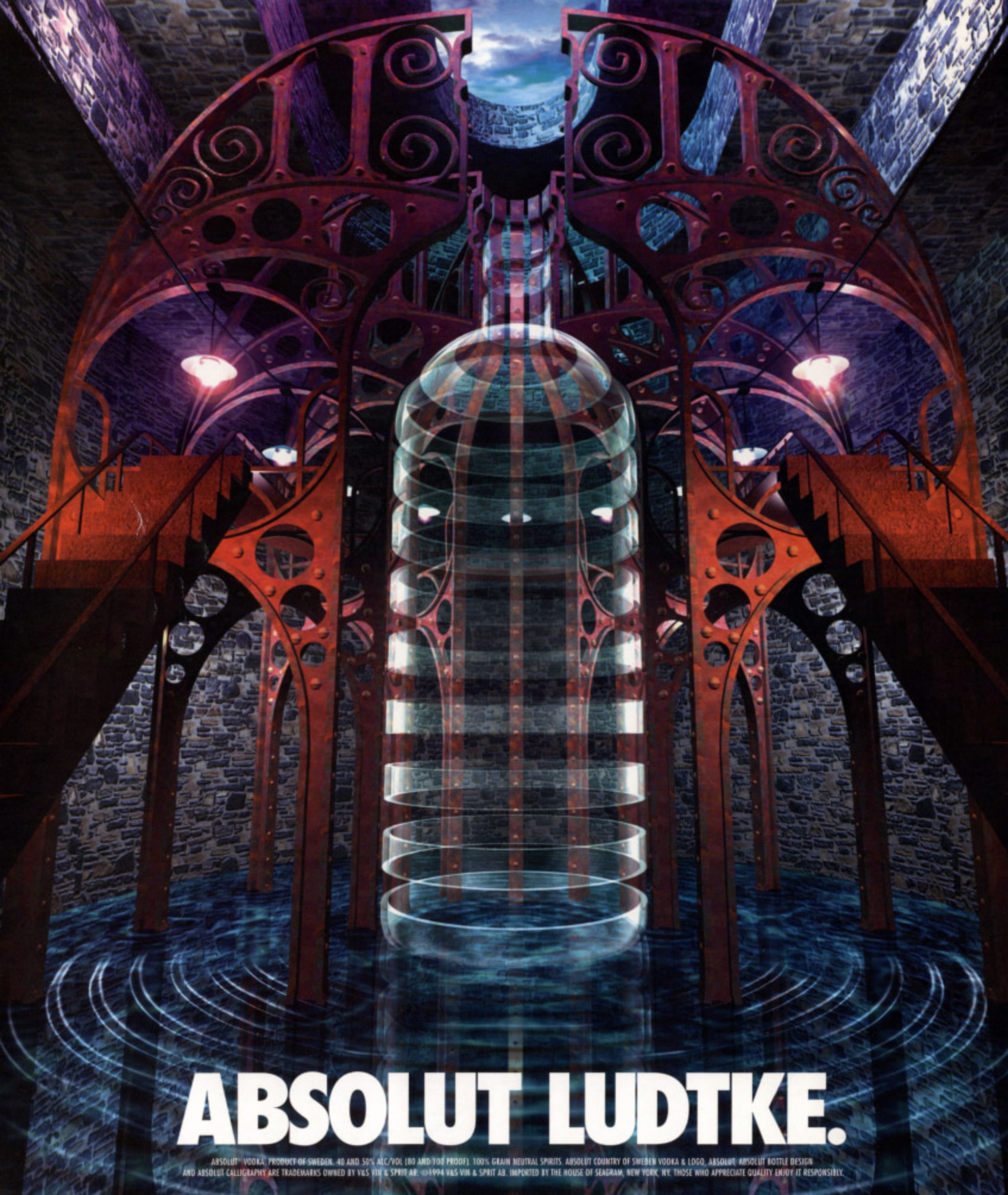
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